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THE Rh HAEM(AGGLUTIN)OGEN

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A TESTING SERUM MADE FROM FOWLS

In a previous communication (GREVAL & CHOWDHURY, 1943) results obtained with the testing serum made from rabbits were given. Since then an antiserum has been prepared from fowls. To 1 c.c. of a washed deposit of rbc of *Macacus rhesus* are added 9 c.c. of distilled water. The test tube containing the mixture is shaken, found to contain a ruby red transparent fluid, the watery lysate, and left in the refrigerator overnight. Next day 9 c.c. of normal saline are evaporated to dryness in another test tube to yield the quantity of sodium chloride necessary to impart the normal salinity to the watery lysate. The lysate is poured into the other test tube. A remarkable change comes over the water damaged rbc which turn opaque again and the contents of the tube look almost like a suspension of undamaged rbc in saline. The contents are centrifuged to separate the cell stroma from the juice. The stroma still coloured is re-suspended in 1 c.c. of saline and injected into the wing vein of a fowl. The plan adopted makes it possible to inject incompatible human blood into a fowl intravenously and to remove most of the toxic hæmoglobin.

The number of injections vary from one to three, given daily. Seven days after the last injection a small sample of blood is removed from the vein and the agglutination titre of the serum for the monkey rbc determined. Measurements are made with standard capillary finger pipettes delivering 50 drops to a c.c. In conformity with the serological usage the titre is taken from the *initial* dilution, not the *ultimate* dilution, and is of the order of 1 in 1000. The birds are bled to death under ether anæsthesia.

On adding 0·25 per cent (of the serum) tricresol dissolved in ether, there appears a strong turbidity which when cleared by settlement in a refrigerator reduces the titre to about half. The preserved serum in suitable dilution also differentiates between human rbc like the rabbit serum.

RARITY OF THE HUMAN TESTING SERUM

In spite of communicating frequently with the maternity hospitals in Calcutta (civil population of the order of 3 million) only 8 samples of blood, from 4 couples, were received from mothers and fathers of cases of what the clinicians considered rather severe jaundice in the infant. Striking cases of erythroblastosis foetalis were not heard of during the year. The incidence of the undoubted disease in Calcutta must be very low indeed, if it occurs at all. No fee is charged for the laboratory examination.

Dr. Janet Vaughen of the N. W. London Blood Supply Depot, Social Centre, Slough, has told the senior writer personally that the incidence of the disease in China appears to be low also.

The plan adopted in testing the mother's blood is this: (*i*) *if it is of the same group as father's,* the effect of the mother's serum on the father's rbc is observed, to exclude or establish intra group agglutination; (*ii*) *if it belongs to group AB,* the effect of the mother's serum is observed on father's rbc to exclude or establish abnormal iso(hæmaggluti)nins; (*iii*) *if the father belongs to group O,* the effect of the mother's serum is observed to exclude or establish abnormal isonins. So far no special anti-Rh serum is needed. The presumption of an Rh negative state in the mother and an Rh positive state in the father arises only when (*i*), (*ii*), (*iii*) are positive. With this plan many bloods can be tested and Rh incompatibility excluded. The agglutination can of course result from an abnormal-isonin also. During the year only one mother raised a presumption of Rh incompatibility. Further tests with anti-Rh serum were not possible for lack of further specimens.

The fresh serum will show isohæmolysis also. It is quite possible that hæmolysis may occur instead of hæmagglutination.

When the serological relations detailed in the plan of the previous paragraph do not hold each blood must be tested by anti-Rh serum.

PURIFICATION OF ANTI-Rh RABBIT SERUM

Results similar to the writers' have been reported in Calcutta recently with purified serum (DAS GUPTA, 1944). The serum was absorbed on and washed off rbc of the rhesus monkey. In the purification there is no immunological advantage which might give more clear-cut reactions. Further, the possible influence of an anti-M antibody arising from the rbc of *Macacus rhesus* in the rabbit has not been excluded by actually testing the human rbc with anti-M and anti-N fluids.

PRESENT POSITION OF Rh

One of the discoveries of Rh now recognises six contrasting characters, Rh, Rh_1, Rh_2, Rh′, Rh″ and rh (WIENER, SONN & BELKIN, 1943). Then there are anti Hr & St iso sera which exist in Rh+ subjects and agglutinate the rbc of Rh— and also some Rh+ subjects (MCCALL, RACE & TAYLOR, 1944). Genetically and immunologically the situation has grown intriguing: a recessive character has manifested itself somatically in the presence of the dominant character.

Lately a warning has been given against 'some recent papers in which the history of Rh has been distorted (WIENER, 1944).

In view of so many advances in such a short time and a distortion the situation cannot be regarded static enough for

forensic purposes at this stage. The tests should not be used in deciding paternity and maternity.

For blood transfusion extra care is called for in cross matching bloods, though perhaps not to the same extent as in England and America. One hour should be allowed for the hæmagglutination for second and subsequent transfusion for all patients and for even first transfusion for cases of abortion, pregnancy or post-parturition states. Even first transfusion to mothers of many years standing, with children that are normal, may be dangerous (WIENER, SILVERMAN & ARONSON, 1942).

For matching prospective couples Rh- should of course be mated with Rh—. In case some negative reactions are uncertain three or more sera should be used. As an added precaution perhaps a study of the iso-antibodies of the prospective bride after at least two intramuscular injections of the prospective bridegroom's rbc would be justified, in parties demanding 100 per cent freedom from the embarrassment of isohæmagglutination. After eliminating the antibodies against O-A-B & M-N the anti-Rh bodies or anti-Hr bodies will be detected by direct tests.

Against the alternative of artificial insemination of a serologically incompatibly mated wife the question of neutralising the destructive iso-antibody by haptens (partial antigens capable of neutralising an antibody but incapable of producing one) is receiving consideration. Such haptens would end all troubles of transfusion too.

SLIDE, TEST TUBE AND BIOLOGICAL TEST

All Rh specialists in America and England emphasise the importance of performing the test in a tube. The writers whose negative figure is *lower* than that of these workers found no difficulty in reading the positive reaction on slides. They consider that for the proper grading of the hæmagglutination a slide is superior to a test tube: centrifugal clumps are ++; centripetal clumps are +; both types of clumps are +(+); a granularity disappearing on agitation and re-forming on rest is ±; and a perfect suspension, or a suspension of the same appearance as the rbc suspension under test with normal saline or with a certain dilution of a normal animal serum, is —.

To fall in step with others in matters of life and death, however, they agree to put up the test in tubes also for matching donors for transfusions, if the slide does not show hæmagglutination.

When hæmolytic reaction is feared and time permits a biological test should be performed in addition to the *in vitro* tests (WIENER, SILVERMAN & ARONSON, *loc. cit.*). Recipient's blood is taken in (*i*) a dry tube and (*ii*) a tube containing sodium citrate, *before and one hour after* transfusion with a sample volume of 50 c.c. of donor's blood. The colour in the two sets of four tubes is compared with a view to detecting hæmolysis.

SUMMARY

1. An anti-Rh testing serum can be prepared from fowls also.

2. The human testing serum and cases of erythroblastosis fœtalis appear to be rare in Calcutta. Tests raising a presumption of Rh incompatibility can be performed without the aid of special sera in many cases.

3. Purification of the anti-Rh rabbit serum does not help.

4. Present position of Rh is commented upon genetically, forensically, clinically and socially.

(*Continued at foot of col. 2, page 51*)

PLACENTA PRAEVIA—A REVIEW OF 103 CASES

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Uterine bleeding in a pregnant woman demands the immediate help of an obstetrician. In the first three months it is generally due to threatened abortion, vesicular mole or ectopic gestation. In rare instances it is due to mucous or fibroid polypi, cervicitis with erosion of cervix or to cancer of cervix. During the last trimester it is almost always due to accidental or unavoidable hæmorrhage—placenta prævia.

This paper deals with 103 cases of placenta prævia (after the fœtus had become viable) treated in this hospital from 1935 to 1942. An analysis of the cases is as follows:

No. of placenta prævia cases treated	103
No. of mothers alive	94
No. of deaths	9
Percentage of deaths	8·74
No. of babies born alive	42
No. of babies born dead	61
Percentage of deaths	59·22

The salient points of these cases are summarised thus:

	No. of cases
Variety of Placenta:	
Complete	10
Partial	103
Para:	
Primara	15
Multipara	88
Term:	
Full term	26
Premature	77
Presentation:	
Vertex	76
Breech	18
Transverse	9
Nature of delivery:	
Natural	20
Simple rupture of membrane	32
Willet forceps	10
Half breech	18
Version	13
Forceps	3
Cæsarean section	7
Condition of baby:	
Alive	42
Died	61
Post-partum hæmorrhage:	15
Mother:	
Alive	94
Died	9

Placenta prævia is both deceptive and dangerous. The patient may wake up in the morning to find herself lying in a pool of blood, as the bleeding comes on without any cause or warning and is painless unless labour has commenced. The bleeding may be slight or very severe.

The best place to treat these cases is in a hospital or a well-equipped nursing home where surgical cleanliness is observed and everything is available for dealing with any emergency. Before removing the patient to the hospital an injection of morphine should be given and a tight abdominal binder applied in such a way as to press the fundus of uterus downwards in the hope that the presenting part may compress the bleeding placental site. A vulval pad and perineal bandage also should be applied.

On admission the patient's blood group is determined and arrangements are made to get a suitable donor. One or more of the following methods of treatment are adopted:

(1) Case is left to nature. (2) Rupturing of the mem-

branes. (3) Application of Willet forceps. (4) Half-breech. (5) Version. (6) Cæsarean section. (7) Very rarely forceps.

If the bleeding is slight and the patient is not at full term a morphia injection is given, absolute rest is ensured and a sedative mixture is administered. If there is no bleeding during the next ten days the patient is allowed to sit up. Vaginal examination is made only when there is recurrence of bleeding. Many cases of partial placenta prævia seen during recurrence of bleeding or in labour require no great interference as with the rupture of membranes either spontaneously or artificially the presenting part comes down and compresses the bleeding points. In some cases Willet forceps are applied to the scalp with one pound traction, and fractional pituitrin injection (3 m) is given every half an hour upto 1 c.c. In breech cases one leg is brought down and a pound weight is attached to the ankle. In shoulder presentation external version or bipolar version is done and a foot is brought down and a pound weight is attached to the ankle. Delivery is never hastened as the cervix tears like wet blotting paper. If the os is closed and there is much bleeding or if the patient is an elderly primipara with a rigid cervix or (any para) with a central placenta prævia, Cæsarean section is advised. Cæsarean section is mainly undertaken in the interest of the mother. After the completion of the third stage a pituitrin or ergometrin injection is given in all cases.

In all cases of antepartum hæmorrhage, postpartum hæmorrhage is not at all uncommon and hence all preparations must be made to deal with this complication. If postpartum hæmorrhage begins, the placenta is expressed by Crede's method and if this fails it is removed manually with strict aseptic precautions. The cervix is examined and any tear repaired. The foot of the bed is raised. Pituitrin and/or ergometrine injection is given and if necessary a hot intrauterine douche at 110°F is administered. Blood transfusion is given should the case demand it.

The following are two illustrative cases:

Case 1—1st para, age 20, full term, wife of a middle class man. Started bleeding in the morning. Though the bleeding was steadily getting worse she waited in her house till about 2 P.M. till a particular lady doctor could see her, and then got admitted in the hospital at 3 P.M. On admission her pulse was 124 per minute, B.P. 95/70 mm. of Hg., vertex freely movable, os one finger dilated. Central placenta prævia. Cæsarean section was done and a male live child weighing 6 lbs. was delivered. During operation intravenous saline was given. Patient was discharged cured.

Case 2—Bled per vagina in her 32nd week of pregnancy. Entered a nursing home and was kept in bed. Started slight pain after a stay of six weeks in the home and got admitted into the hospital after covering a distance of five miles in a car. Patient began to bleed profusely when P. V. examination was made, condition of the patient became bad. Pulse 170 per minute, B.P. (systolic) 60 mm. of Hg.; Veritol and 2 pints saline were given. Foot of the bed was raised. After saline B.P. was 110/50 mm. of Hg. Under chloroform, Cæsarean section was done and a live female child was delivered. During operation blood transfusion was given. Patient was discharged cured.

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SOME OBSERVATIONS ON ETIOLOGY & PATHOLOGY OF NEISSERIASIS (N. GONORRHOEAE INFECTION)

Its Symptomatology Relevent to Systemic and Urogenital Syndrome

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(*Contined from previous issue*)

THE ACCESSORY SEX GLANDS: THE BULBOURETHRAL AND THE PROSTATE GLANDS

These sexual, genital or reproductive glands which are accessory elements invite our attention as their involvement is so common in gonorrhœa. As a matter of fact, involvement of the urinary and the genital tracts reflect remarkably on each other clinically as well as pathologically. With these glands are related their ducts and reservoirs (*vide infra.*).

The *bulbourethral or Cowper's glands* are situated between the two layers of the triangular ligament, their fine ducts open at the commencement of the bulbous urethra in its ventral aspect. A normal gland is not palpable nor is an endoscopic view of the minute openings of its ducts, if normal, possible. If however, it is inflamed and indurated or undergoes suppuration, it can be palpated bimanually with the index finger in the rectum and the thumb in the perineum as a tender nodule. The commonest cause of infection of these glands is back pressure brought about by forcible syringeing or high pressure lavage of an infected urethra. Cowperitis is a common cause of chronic posterior urethritis due to reinfection of the urethra by stored organisms in these glands. A suppurating Cowper's gland should be differentiated from a periurethral abscess, because while the former should be incised, the latter should be treated either endoscopically, or by puncture and aspiration in order to avert possibilities of urinary fistulæ.

The prostate gland. The prostate lies mainly at the neck of the bladder and surrounds it and in its embracement, it is pierced by the ejaculatory ducts. The prostatoperitoneal (Denovillier's) fascia separates the prostate, the ampullæ and the seminal vesicles from the rectum. Its glandular and interstitial muscular elements have the ratio, 5:1. There are occasional lymph nodes in the interstitial tissue. The prostate consists of two different types of secreting units, the external or the gland proper and the deep, internal or periurethral which, however, is a small portion of the gland. Branched follicle-like alveoli are arranged concentrically and from these, ducts, 30 to 50 in number, following the curve of the gland enter the prostatic urethra and open on either side of the verumontanum and its cristæ. The periurethral portion of the prostate in a way corresponds to the glands of Littre. It may incidentally be mentioned that while hyperplasia of the gland involves the external secreting units of the gland, the periurethral or internal units are more liable to undergo malignant changes. The vascular and lymphatic arrangements of the prostate render extension of infection to periprostatic area possible.

EXAMINATION OF THE PROSTATE, SEMINAL VESICLES, ETC. —We investigate involvements of prostate, vesicles, etc. in gonorrhœa initially, by digital exploration. The nature and extent are ascertained by digital palpation per rectum (P.R.)

and examination of the fluids obtained by massage of the prostate (P.M.) and of the vesicles (V.M.). Some manipulative and technical details are to be observed:—

I. *Preliminary measures*—(1) Patient holds urine for at least two hours prior to examination.

(2) An analgesic suppository is indicated in the following conditions: (*i*) in nervous patients; (*ii*) if the prostate or adjacent structures are tender; (*iii*) if there are rectal fissures, hæmorrhoids, proctitis, erosions and ulcers (dysenteric, etc.).

(3) For two (or three) glass tests, obtain patient's urine in one of the following ways: (*i*) passes urine in two successive glasses; (*ii*) partly empties bladder before and the balance after P.M. or V.M.; (*iii*) empties bladder, then takes a long drink of water, then P.M. or V.M., then collect urine; (*iv*) lavage urethra, then P.M. or V.M., then collect urine; (*v*) inject a dye solution into urethra (*e.g.*, methylene blue), then P.M. and collect urine.

II. *Decubitus*—Three different positions are advocated by urologists for P.M. or V.M. (1) Patient stands and bends over the back of a chair. (2) Patient lies prone on couch or preferably on an urology table and adopts the knee-elbow position. (3) Patient lies dorsal on table and assumes a knee-chest or exaggerated lithotomy position.

Some patients, particularly those of a nervous disposition feel faint and even faint away while undergoing P.M. or V.M. in the first two positions. It is claimed that in these positions the expressed fluid escapes by gravitation but this apparently applies to the pendulous urethra. After massage as the fluid in this portion is 'milked out', the question of gravitation hardly arises. The third dorsal position does not cause shock and gives manipulating facilities for the collection of the fluid. The following case report is interesting:—

Case Report 13: A young European patient consulted a German doctor who according to him had strong index fingers and did P.M. in No. 1 position. He felt very bad and quite faint; when he consulted us he related his experience and was willing to submit to any other method of examination but P.M. He did not even object to urethral instrumentation and endoscopy, which were done without any analgesia. Eventually, he was persuaded and P.M. in the dorsal position was not objected to.

III. *What the exploring finger looks for and may find*—(1) Anorectal sphincteric spasms; eliminate conditions enumerated above. If necessary, use analgesics and make a proctoscopic examination and take smears for examination; if there are indications, add atropine to analgesic suppository. Wait for its absorption.

(2) The prostate. Does it feel warm? Size, contour, outline. Flat and flabby (sub-functioning). Mobility, restricted by adhesions (periprostatitis, inflammatory); fixed and irregularly hard, (malignant); consistency uniformly hard (senile or syphilitic), induration if diffuse (chronic inflammation), if localised (nodes), hard and soft spots (local suppurations); fluctuating areas (pus pockets). The lobes: lateral; median (intravesical projection) the median notch; extent: distal, proximal (approaching seminal vesicles) and lateral limits. Sensation: tenderness or actual pain. Irregular or localised marked hardness with suspicious crunching (prostatic calculi). Marked induration with palpable and indurated vesicles, hæmospermia and epididymitis (tubercular).

(3) The seminal vesicles. Size, outline, extent; if its distal end meets the proximal end of prostate. Consistency: nodes, induration, fluctuation (gonorrhœal pus pockets), adhesions (perivesiculitis).

(4) The ampulla of *vas deferens*. Examine as for vesicles.

(5) bulbourethral glands. Bidigital palpation (index finger in rectum and thumb on perineum). If normal, not palpable; if infected, a small nodule which yields characteristic threads or floaters in the urine after massage.

(6) Conditions of the prostate (summarised). In the prostate, therefore, a variety of conditions are found:—

1. The acute or subacute prostate: this must not be massaged as consequences may be disastrous. 2. The chronic prostate: varyingly tender on palpation. 3. Prostate normal to the feel on the whole, but history of occasional cloudy urine followed by urethral discharges, possibly means latent subacute abscess; repeated massage and two glass tests may help matters. 4. Nodular prostate might mean G. C. nodes, T B or malignancy; these have to be differentiated. Caution: massage in T.B. might lead to sudden dissemination (case report). 5. Indolent prostate: if dry tap with no response, try diathermy, endothermy, mild shortwave inductothermy and then massage for tests. 6. Calculous prostate: crepitus on palpation. 7. Senile adenomatous, hyperplasic or hypertrophic prostate with prostatism. 8. A gonococcal prostate in a tubercular or glycosuric patient.

THE TECHNIQUE OF MASSAGE.—A. *Prostatic massage* (P.M.). There is a great variation in individual tolerance; gentleness is the watchword. Local anæsthesia, if necessary. We do not rub rectal mucosa with finger as friction irritates and renders subsequent massages painful and objectionable. We do not cross-massage, that is, not from one lobe passing across the median sulcus and urethra to opposite lobe. It is massaged with rolling movement of the finger and graduated compression lightly applied from base to apex and from lateral aspects of either lobe to midline. There are two sphincters; the proximal is weak and the distal strong. Overstimulation and irritation by ungentle massage may cause: (*a*) spasm; the distal, urethral sphincter ('cut off' or 'shut off' muscle) causing strong contractions, the expressed fluid would escape along line of least resistance through the weaker, proximal (vesical) sphincter into bladder; or, (*b*) set up antiperistalsis in ejaculatory ducts forcing fluids up the ducts, risking vesiculitis and epididymitis.

B. *Vesicular Massage* (V.M.): Difficult with short fingers. Use local anæsthesia to relax sphincter and ask patient to bear down. V.M. should be from above down, towards ejaculatory ducts.

Differentiate prostatic and vesicular fluids by:—

(*a*) Three glass test; (*b*) induce urethral congestion by endothermy application, express fluid by a milking process; (*c*) then P.M. and (*d*) then V.M., first the right vesicle and then the left; make separate collections if available, otherwise collect urine on each occasion.

CLINICAL AND PATHOLOGICAL DIFFERENTIATION OF PROSTATIC INFECTIONS AND OTHER CONDITIONS

From what has been said it will be seen that gonococcal prostatic conditions have to be differentiated from infections with other organisms and from diffuse or localised parenchymatous, senile enlargements and other conditions. Pyogenic cases are more serious with high mortality, unless early surgical measures are adopted, whereas a gonorrhœal prostatic abscess hardly ever requires drainage. Repeated rectal palpa-

tions are necessary with care and gentleness in order to distinguish a 'senile prostate' from chronic gonorrhœal prostatitis or prostatic suppuration; periprostatic extension of sepsis should be avoided by gentle manipulation. In gonorrhœa, bilobal involvemet is common enough but the general contour of the gland is not lost unless it had ben previously molested by undue manipulation or ungentle massage. On the other hand, in hæmatogenous, metastatic prostatitis of septic origin, involvement of the gland as a whole with pericapsular infection and alteration of its contour is common and diffuse bogginess or localised soft areas, prevesical, retrovesical and ischiorectal suppurations are not unusual complications. Metastatic infections take place from sepsis of fauceal, dental and other distant foci.

In view of the anatomical structure of the gland and its ducts it would appear that the drainage facilities of the prostate are inadequate as it depends more or less entirely on its extrinsic and intrinsic muscles and adjacent tissue pressure. Thus, parenchymatous inflammation in presuppurative stages would rise to diffuse or localised indurations, known as prostatic nodes; when suppuration takes place, one or more of these areas become soft and boggy. Periprostatic extension, either subcapsular or pericapsular, gives rise to diffuse bogginess or purulent collections in prevesical or retrovesical spaces and may terminate in perineal or ischiorectal abscesses or may even open into the bladder or rectum. The inflammatory process may cause plastic or exudative peritonitis and in rare instances serious complications.

Case Report 14: An elderly gentleman, a Bank Manager, had neisserian infection in his youth for which he had indifferent and interrupted treatment with frequent changes of doctors; his wife having had no treatment, developed adnexitis. Naturally, vicious circle was established and the infection perpetuated. Some years later, a swelling appeared in his perineum and became tender; he had rigors and high temperature. His neisserian history was withheld from his doctors and consultants. Suppuration being suspected a horse-shoe incision was made on the perineal swelling; as no pus escaped even after digital dilatations and explorations, a drainage tube was inserted; the wound took a long time to heal; the mass persisted and some time later, he began to notice muco-pus in his stool. On consulting me, he admitted his old infection, also that his wife had pelvic pain and other signs of adnexal involvement. On examination, P.R.: hard and soft areas in the prostate; higher up and posteriorly, in the intervesicular area, the tip of the finger seemed to dip into a recess and immediately above this a semifluctuating area was felt. P.M.: purulent matter; on culture gonococci and B. coli. Urethroscopic examination: buds of granulation, erosions and ulcers on the mucosa, markedly in the prostatic urethra. Conclusions: evidently a case of prostatic and periprostatic involvement and possibly adhesions with the rectum giving rise to secondary proctitis and periproctitis. Treatment: urethrovesical and rectal lavages, instillations, endoscopic focal applications and dilatations improved the condition; chemotherapy and vaccines further improved him; finally, best results were obtained by diathermy and shortwave inductothermy.

Occasionally, concretions and calculi form in these cases; they may be passed with urine, otherwise extend to the urethra or bladder causing difficulty in diagnosis. I can think of two rather interesting cases.

Case Report 15: A middle-aged, legal man suffering from much neglected gonorrhœal complaints, consulted me for what was diagnosed as 'senile prostate'. P.R.: prostate indurated with nodes unusually hardish and irregular; the gland, however, not fixed, history of hæmaturia. On urethral exploration by bougies: obstruction in the posterior urethra and a gritty sensation. Radiological examination: shadows in the prostatic region. Treatment: prostate exposed by perineal route and divided by acusection (diathermy cutting), several calculi delivered and the wound drained. Result: quite satisfactory.

Case Report 16: A senior cavalry officer with an old history of simple urethritis, consulted a specialist in London for persistent prostatic irritation; prostatic calculus was diagnosed and an attempt was made to extract those by transurethral 'electric' methods. A very minute 'calculus-looking particle' was extracted but there were smart intravesical hæmorrhages and clots had to be evacuated on several occasions by aspirating cannulæ. The discomfort persisted and a good deal of sexual disturbance having developed, he consulted me. On examination: a middle-aged officer of good bearing and in a remarkably good physical and mental health. Complaints: a vague discomfort high up in the perineum; can manage easy riding but arduous riding of a cavalry officer or a game of polo caused pain in the perineum and up the rectum followed by urinary urge for some time. Lumbosacral pain which he attributed to a polo accident, seemed to me to be a prostatovesicular reflex. Evidences of sex-complex of 'over-sex' type; marked ejaculatory disturbances, ejaculatio-præcox and an uncomfortable 'unfinished' feeling. P.R.: Prostate, loss of contour, flabby, non-resilient and flattish. Seminal vesicles, normal. Urethroprostatic fluid, culture: negative; cytologically: deficient in granules, spermin crystals and corpora amylacea. Endoscopically: prostatic urethra pale and non-vascular. Lumbosacral region on palpation and tapping a vague ill-defined tenderness.

Treatment: Prostatic diathermy and short-wave inductothermy; instillation. General U.V.R. exposures. Vitamins and endocrine therapy, prostatic and orchic extracts orally and parenterally. Steady improvement during nine months of rather interrupted treatment due to service exigencies. Result: Lumbosacral pain and prostatic discomfort disappeared; rides, plays polo and performs the functions of a cavalry officer. Has married since and feels sexually normal.

Remarks: In this case the trouble was evidently not due to the minute prostatic calculus (?) but the result of chronic inflammatory processes in the prostatic urethra involving the verumontanum and sub-function of the prostate and accessory glands.

The Ejaculatory Ducts, Vas Deferens, its Ampullae and Seminal Vesicles

The Ejaculatory Ducts. The ejaculatory ducts open at the common meeting ground of the seminal and the lower urinary tracts; the two short, narrow independent canals for the seminal vesicles and ampullæ, unite at slightly varying angles to for the common ejaculatory ducts. These ducts are not mere cylindrical tubes but have appendages consisting of folds, diverticula and tubular glands of the prostate type; their walls are provided with circular and longitudinal muscular fibres; sphincteric action of these fibres or a valve-like action of the mucous folds at the openings of the ducts in the ampulla and the vesicle have a peculiar action, so that fluids coming *via* vas or ejaculatory ducts, go initially to the vesicles before escaping either through the vas or ejaculatory ducts. This explains the high frequency and chronicity of vesiculitis and

for this reason, infected vesicles have been called 'pus sacks of gonorrhœa'.

The patency and functioning of the ejaculatory ducts are of clinical importance, particularly with reference to sexual disturbances and vague neuroses which in many instances affect sexual relations in a remarkably adverse manner. Thus, verumontanitis which is a major implication of prostatic urethritis and secondary involvement of the ejaculatory ducts, call for consideration, since clinical evidences of pathological conditions of structures in such close relation can hardly be limited to one structure to the exclusion of others. Such lesions are: simple congestion with vascularization and œdema; chronic inflammation with lymphocytic infiltration and induration; buds of granulation encroaching upon the lumen (soft strictures); fibrosis (hard strictures); polypi, cysts, etc. These and chemical or instrumental trauma affecting the lumina of the ducts are potent causes of disordered ejaculation. Surgical measures for instillations of the urethra or the ducts, lavage of the seminal canals and its sacks, strong negative pressure suction, mucosal trauma, accidental injury to the verumontanum in prostatectomy may, besides other conditions, cause vesiculitis and other complications due to ascending infection. These patients complain mainly of a slight but persistent urethral discharge and sexual disabilities; a careful endoscopic examination and laboratory tests are necessary to ascertain the exact condition. Absence of neisserian cocci or even secondary organisms is not at all uncommon; it is more often the pathological conditions which had been induced by them and their perpetuation or further elaboration that cause the symptoms. As a matter of fact, in rare instances there is no history of exposure but a history of catheterization or a postnatal infection in the female partners.

The *vas deferens, ductus deferens or spermatic duct,* a direct continuation of the tail of epididymis is a fine canal, 15 to 18 inches in length. It is identified in its course by its firm consistence on palpation. Its walls consist of: a superficial fibrous sheath; three remarkably well-developed muscular tunics, the inner and outer longitudinal and the middle circular thus capable of strong peristalsis; a basement membrane supporting a submucosa which is in longitudinal folds. In order to carry testicular secretion from the tail of the epididymis up the scrotal portion, round the bends in the inguinal canal and in the pelvis to its opening in the verumontanum, the musculature of its walls naturally has to play an important part. This fact, has clinical interest as with chemical, neurogenic or mechanical irritation the peristalsis reverses its direction. Clinical evidences of antiperistalsis due to injudicious instrumentation and irritation is supported by animal experiments conducted by Schinder who by irritating the prostate and verumontanum produced reversed currents. Both clinically and experimentally, administration of atropine (injections or suppositories) has been found to inhibit this antipersistalsis and reduce possibilities of ascending infection up the ducts setting up vesiculitis and epididymitis.

For clinical purposes, vas deferens can be divided into four anatomical portions, namely: 1. The testicular or vaginal, the sheathless portion inside the tunica vaginalis; this portion becomes indistinguishable if there is epididymitis; 2. The scrotal or funicular; sheath commences here but is loosely attached; can be easily palpated and distinguished from other structures of the spermatic cord; 3. The inguinal or transparietal where the sheath is in many places incomplete; and 4. The pelvic or extraperitoneal portion, leaves the spermatic vessels, sheath firmly attached to the pelvic wall, crosses the external iliac artery and loops over the ureter.

In the two latter portions, ascending infection *via* the vas deferens may spread to other structures of the spermatic cord and result in funiculitis. In operations for vasectomy and vasotomy, for instillation or lavage, vasaligation, etc., if special care is not taken, infective material may escape into the subsheathal space and spread distally or proximally.

Case Report 17: A case of chronic gonorrhœa. Consulted specialist in a London Hospital who diagnosed it as vasitis (deferentitis) and vesiculitis and performed vasectomy for drainage and irrigation. Returns to India. Consults us as there was a feeling of discomfort and a gleety discharge, ejaculatio præcox and emissions. Urine: first second and third glasses, floaters of all shapes and sizes. Endoscopy: prostatic urethra, buds of granulation, congestion and patches of leukoplakia. Culture: B. coli and other secondary organisms. P.R.: prostate, indurated and nodes; vesicles, indurated and boggy areas. Treatment: prostatic diathermy, massage, short-wave inductothermy and lavage, some relief, but endothermy seemed to give further relief. Finally, injections of neo-iodipin in liquid paraffin gave best results. Ionisation had only temporary effect. Occasional dilatation with bougies and Kollmann dilator had some temporary effect.

Case Report 18: Vasectomy performed for 'senile prostate'. Evidently there was some latent infection which entered the sheath and was followed by severe inflammatory reaction, funiculitis and epididymitis with rigors and high temperature. Local treatment and sulphanilamides subsequently relieved him.

Vasitis (deferentitis) by itself is not a common complication and is generally associated with funiculitis. This may happen in either gonococcal or pyococcal infections, mixed infections and in filariasis with secondary infections, the lymphvascular arrangement facilitating this. In these cases the vas is considerably indurated, its terminal portion, the ejaculatory ducts in the prostate and the verumontanum are felt as a curvilinear elevation. The thickened vas itself is often felt like a whipcord in its palpable portions.

In order to guard against possibilities of subsheathal extension of infection, I operate these conditions electrosurgically with good results.

Inflammation of the pelvic portion of the vas gives rise to vague pelvic pains and may be confused with ureteritis, ureteral calculi, periostitis of the pelvic bones, etc.

Case Report 19: Age 32, from the North-West Frontier Provinces. Consulted with a diagnosis of ureteral calculus from his local physician, confirmed by a skiagram. Examination: palpation, a tender area in the right iliac fossa. Contrast excretion urography: no calculus shadow in the ureter; the dye was excreted and escaped by the ureter which was somewhat dilated; ureteral spasm. A calculus shadow seen outside but contiguous to the ureter. The provisional diagnosis was, either a calculous lymph node or a phlebolith. Patient unexpectedly developed signs of 'acute abdomen' emergency laparotomy: a calculus found in one of the smaller veins pressing on the ureter near the brim of the pelvis, this portion of the vein excised after proximal and distal ligatures. Ureter rather thickened. Later, P.R.: prostate large, nodes with soft areas, seminal vesicles thick; P.M.: fluid disclosed G.C. and secondary organisms. Urinary antiseptics with P.M.,

diathermy and short-wave inductothermy relieved the symptoms.

Case Report 20: A young man, zemindar. Pain in the left iliac fossa, consulted with a diagnosis from other surgeons as a case of periostitis of the ilium. Examination: P.R.: thickening and a mass just beyond the prostate. History of gonorrhœa; P.M. revealed G.C. and secondary organisms. Autogenous vaccine injections, urinary antiseptics, prostatic instillations, diathermy and iodides cured the complaint.

The ampullæ are spindle-shaped dilatations of the terminal vesiculoprostatic portion of the vas. Their ducts open obliquely into the main ejaculatory duct. Their walls have mucosal plications, diverticula and pouches and there are submucosal, intermuscular glands of tubular type. Its structure is very similar to that of the seminal vesicle.

The Seminal Vesicles. Sacculated pouches lying alongside and lateral to ampulla, separated from the rectum by Denonvillier's fascia and in close relation to the ureters, the bladder and the prostate. Their relation to the testes is in a way comparable to that of the gall bladder to the liver and to a less extent, of the urinary bladder to the kidneys. As in the ampulla there are convolutions and diverticula, pouches, folds and plications and tubular glands both submucous and intramuscular. In sections: a honeycombed appearance and blind diverticula. These have perhaps the most difficult drainage possibilities of any organ in the body; it would seem that ejaculation and seminal overflow are the only means of its drainage. Suppuration in these sacs so often associated with prostatitis is thus liable to convert these into pus cavities, the 'gonorrhœal pus sacs' in the male, similar to the pus bags of pyosalpinx in the female. Functionally, a vesicle is a seminal reservoir but it may also be considered as an accessory sex gland with special functions as it is in some other animals; some even think that apart from its external secretion it presumably has endocrine properties. The multitude of obscure clinical phenomena in patients suffering from vesicular disease supports this view.

Vesiculitis also called spermatocystitis is thus a serious complication of gonorrhœa and is attributable to several factors; for instance, the peculiar structure of the sacs and their topography render these accessible to proximal and distal routes of direct infection; the lymph circulation of the vesicles, the vas, urethra and bladder is from the same source; pathological occlusion of the lumen of the vas causes stasis in the sac and lastly there are possibilities of hæmatogenous pyogenic infection by pyogenic organisms such as by B. coli or by specific types such as tubercle bacilli.

Vesiculitis is mostly secondary to prostatitis or is associated with it and its sequelæ, thus prostatovesiculitis is the more common condition.

Gonorrhœal vesiculitis is diagnosed P.R. as a spindle-shaped mass which may be soft and boggy or indurated and nodular. Perivesiculitis holds it to surrounding structures, by adhesions, sometimes by plastic peritonitis. Clinically, as in salpingitis it gives rise to sacrococcygeal or lumbago-like pains, vague abdominal pains or referred pains down the inguinal regions, perineum and the thighs. Pain at the end of micturition, blood-stained semen and urine may occur according to its acuteness and chronicity.

A palpable vesicle is not necessarily pathological as there are great anatomical variations in its size. Occasionally, it is difficult to delimit the prostate and vesicle.

Vesiculography as a diagnostic measure is of little value, its only usefulness if any, is in finding the patency of the ejaculatory ducts.

The Epididymis and the Testicles

Drainage possibilities of these structures are practically nil because of the tortuous, folded and very fine seminal tubules so that they get easily occluded even with mild inflammations. There may be resolution, fibrosis (nodes) or cytolysis and suppuration. Orchitis of hæmatogenous origin is not rare; it occurs in gonorrhœa either through the anastomotic external spermatic and deferential arteries or by extension from epididymis when it becomes epididymoorchitis.

Epididymitis on the other hand is mostly gonococcal; of 3606 cases of epididymitis only 606 were tubercular or pyogenic and the remaining 3000 gonococcal. Gonococcal epididymitis is mainly due to direct extension from vas deferens, *i.e.* by ascending infection *via* its lumen or by the lymphatic route. Exciting causes: strain, physical or sexual, trauma (surgical, by instrumentation of infected urethra) or due to antiperistaltic waves of the vas as a neuromuscular reflex; thus pre-manipulatory indication is the use of local anæsthetics and belladonna. Hæmatogenous epididymitis (metastatic) is rarer than orchitis but is not uncommonly associated with vesiculitis in urogenital tuberculosis.

Are these conditions due to gonococci or their toxins (gono-toxins)? In favour of gonotoxin is the fact that heat therapy is not uniformly effective. The possibilities are that there is an element of latency with the gonococci caught in the tubules. Heat has only an indirect effect if the lesion is gonotoxic by causing hyperæmia, serum exudation which dilutes the toxins.

In ascending infection, the globus minor (tail) is attacked first, then it spreads to the body and globus major (head). Clinical experience is supported by experimental injury caused to the vas deferens in animals. On the other hand, hæmatogenous infection affects the head of the epididymis, then the body and last of all the tail, that is, in the reverse direction to ascending infection.

(*To be continued*)

(*Continued from col. 1, page 46*)

5. A test tube may be employed in addition to a slide in selecting donors of blood. A biological test should also be performed if time permits.

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THE RÔLE OF HORMONES IN INFERTILITY IN THE MALE

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INTRODUCTION

It is estimated that on the average one in every ten married couples is sterile. As the biological result of sexual intercourse between an adult male and an adult female is conception, infertility is distinctly a pathological condition. Its primary causation is the nonfertilisation of the ovum by the spermatozoon, which may, however, be due to diverse causes, such as (1) the male partner has no sperms or only defective sperms or (2) the female partner has no ova or only defective ova, or (3) that there is some factor or condition which prevents these from meeting at all or meeting during those days when alone fertilisation can take place. Of these, the last factor is the easiest to diagnose and remedy. Coitus to be fertile should take place round about the ovulation day in a menstrual cycle. As regards (3), the condition is caused by some obstruction in the genital passages of the male or the female partner. We are concerned in this paper only with (1).

It was once believed that defective spermatogenesis and semen were solely and entirely due to hormonal upsets or deficiencies, but recent studies have shown that they may also be produced by constitutional disorders, extrinsic poisons, nutritional defects and diseases of the genital organs. The semen picture in conditions caused by hormonal upsets as well as by the other factors is identical and so diagnosis in a particular case is often extremely difficult, especially when it is remembered that the constitutional disorders believed to cause or predispose to infertility range from the more serious diseases such as typhoid and diabetes to simple disturbances such as constipation and carious teeth. To exclude all the minor disturbances is almost an impossible task.

Ordinarily, the man approaches the doctor for investigation and treatment from three to seven years after marriage but in my records are cases where this has been done only after fifteen to twenty years. Roughly it may be said that the man when he comes for treatment is from thirty to forty years old. The past history, therefore, is usually vague and even if it is not so, it is often difficult to decide which particular disease that the man suffered from in the past contributed to his infertility. Even assuming that this can be done, it is not known what damage the particular disorder has caused and how it is to be remedied. All the same, it is wise to go carefully into the past history in every case of infertility. Extrinsic poisons and diseases of the genital organs are easier to exclude and, as knowledge of vitamins is accumulating, their deficiency in the diet can be more or less accurately gauged.

THE GONADS

The endocrine glands known to influence fertility are the gonads, the anterior pituitary and the thyroid. The studies regarding the last two have not yielded much practical result and the views of various workers have often been conflicting and so it is proposed to discuss only the relation of the gonads to sterility. As far as treatment is considered, a knowledge of this aspect alone is sufficient for all practical purposes.

The testicles have two distinct functions, an exocrine function, *i.e.*, the production of spermatozoa, and an endocrine function, *i.e.*, the production of the male hormone. The exocrine function is dependent on the endocrine function. These two functions are performed by two sets of tissues, the seminiferous tubules and the interstitial tissues. The subject would have been simple if these reacted similarly to external and internal adverse conditions, but they do not do so. Constitutional, nutritional and local disturbances affect spermatogenesis more commonly and more easily than hormone production. In other words, if a man suffered from malaria or typhoid, his spermatogenesis is upset, *i.e.*, he becomes infertile, but his hormone production continues, *i.e.*, he does not become impotent. If it was the other way round, he would have sought treatment earlier.

Spermatozoa are continually produced by the epithelial cells of the seminiferous tubules and passed on to the epididymis where they are stored and mature. From there, they pass on to the seminal vesicles. The bulk of the semen discharged consists of the secretions of these and the prostate gland. The male hormone is essential for the proper functioning of the seminiferous tubules and for maintaining the epididymis, seminal vesicles and prostate gland healthy. The normal secretory activity of these accessory sex organs also depends on the male hormone. Spermatozoa unmixed with secretions of the seminal vesicles and prostate gland are infertile. This is the rôle of the male hormone in fertility.

Recent studies have indicated that the testicle secretes two other hormones as well, one physiologically allied to the follicular hormone of the female and the other exerting some influence on the gonadotropic activity of the anterior pituitary. About the latter very little is known but the former is believed to take a part in the development and functional activity of the accessory sex organs. It is, therefore, possible that defective semen and sperms may be caused also by deficiency of this hormone as well. I have satisfied myself therapeutically that this is so because in these conditions better results are obtained by the administration of both the male and follicular hormones. This subject is discussed in detail later.

The study of semen has been perfected in recent years, but this has not made the subject of sterility easier. A few known facts regarding the subject are given. Defects in semen and spermatozoa are usually discussed under the following headings: Oligospermia, oligozoospermia, azoospermia, necrozoospermia and asthenospermia. These terms need explanation. Oligospermia means that the quantity of semen discharged is small. Oligozoospermia means reduction in the number of spermatozoa, while azoospermia, also known as aspermia, means their complete absence. Necrozoospermia is a condition of semen in which are present "large numbers of immotile but morphologically normal spermatozoa in which motility cannot be induced by warming or similar procedure." Asthenospermia means lack of vitality or longevity of the spermatozoa.

The question that has not yet been satisfactorily answered is whether these conditions are caused by hormonal upsets or by the nonendocrinal factors mentioned previously. In my opinion, hormonal upsets occur only in sexual infantilism, partial or total, and this is a developmental anomaly. By partial sexual infantilism, I mean the vast number of unclassified cases in which various combinations of infantile sex and accessory sex organs are seen. In infertility, the cases that are of interest are only those in which the penis and even the testicles appear normal in size but the accessory sex organs are infantile. These men discharge a small quantity of fluid,

possibly not "semen", which contains no sperms or only immature and immotile sperms. This subject needs further study.

After adult age has been reached, no hormonal upsets are possible. I am basing this observation on the available literature and on my studies of a large number of cases of impotence that have passed through my hands. Even in old age, active and fertile spermatozoa are seen after the eighth decade of life and authenticated cases are on record where men have procreated at these ages. The microscopic studies of R. A. Moore on the prostate gland have shown that individuals often show good evidence of hormone secretion even in the eighth decade of life. Hormonal upsets occurring after adult age as a cause of infertility can, therefore, be ruled out. We are, therefore, forced to the conclusion that oligospermia and similar other conditions are produced by nonendocrinal factors which cause damage, temporary or permanent, to the epithelial cells of the seminiferous tubules. In four of my cases, men who were fertile developed oligozoospermia or aspermia after attacks of typhoid, malaria or diabetes or as a result of chronic alcoholism. In none of these cases was there impairment of sexual potency.

It must be emphasised however, that the defective conditions of the semen and spermatozoa can often be remedied by hormonal treatment, unless the damage to the epithelial cells of the seminiferous tubules has been considerable. Thorough eradication of the condition which produced the defects and good general health are prerequisites for the effectiveness of the hormonal treatment.

Prevention of damage to the cells of the seminiferous tubules should be possible by appropriate measures taken during the active and convalescent stages of diseases known to do so. Hormones are obviously inadvisable. Biskind and Falk (1943) say: "Nutritional therapy, especially with the vitamin B complex, alone or in combination with vitamin E, was followed by improvement in the number, motility and morphology of the sperm in previously infertile men. In other cases of sterility in which initial specimens of spermatic fluid were apparently normal, therapy with vitamin B complex alone apparently restored fertility without producing significant detectable changes in the sperm. Excluding one case of virtual azoospermia, among twelve cases so treated, eight impregnations occurred." While these conclusions appear logical, one finds it difficult to reconcile them with the fact that the poor, who are comparatively unhealthy and eat unnutritious food which scarcely contains any vitamins, are notoriously prolific. That means that fertility does not necessarily depend on general health or a balanced diet but there are other factors which are not yet understood. All the same administration of vitamins E and the B complex during the active and convalescent stages of constitutional disorders appear to be the most feasible way of preventing genital complications. What the dosages of these should be and whether other vitamins also would help require further investigation.

Gonorrhœa is recognised to be the commonest cause of obstructions in the seminal passages and it is possible with care to prevent these. Venereologists and urologists should make it a point to examine the semen for possible azoospermia before a patient is discharged as cured after an attack of gonorrhœa. Syphilis causes damage to the cells of the seminiferous tubules if treatment has not been taken in hand early or if treatment has been inadequate. It is advisable, therefore, to have the semen examined before the patient is discharged as cured.

Examination of Semen

It is advisable to say a few words about collecting samples of semen, as faulty collection vitiates the accuracy of the results of examination. The semen may be pipetted from the vagina soon after it has been discharged, ejaculated direct into a dry and clean wide-mouth bottle or test-tube after coitus or extracted with the use of a sheath. The end of the sheath is snipped with scissors immediately after use and the semen emptied into a dry clean wide-mouth bottle. The sheath, however, has to be prepared by previous washing in water and drying on filter or blotting paper. If this is not done, spermatozoa usually appear immotile because of the deleterious action of the powder and other extraneous substances present in condoms. The simplest method however is to extract semen by masturbation but some men find it almost impossible to do so. I advise my patients to produce a masturbation specimen and, when this is not possible, that discharged direct into a dry, clean bottle after coitus.

The semen should be examined as soon as possible after it is extracted. As regards transporting the semen, opinions differ. Some suggest keeping the glass container cool in a thermos flask containing cold water while others advise keeping it warm, in that "handy human incubator, the waist-coat pocket." I prefer the latter method as it is simple and suits all men.

Oligospermia—Oligospermia means decreased secretory activity of the accessory sex organs and not defective functioning of the seminiferous tubules. The volume of the semen need therefore have no relation to the number of spermatozoa present in it.

Certain standards have been laid down as regards the normal volume of a fertile semen. Some maintain that this should be between 1·5 and 3·5 c.c. and that anything less than 1·5 c.c. should be considered as oligospermia. Hotchkiss says that during a study of specimens of semen from 150 men, the volume of ejaculate averaged 3 c.c. in the fertile group and 2·9 c.c. in the barren group. I think the volume of semen ejaculated should be considered together with the numer of spermatozoa per c.c. present, as it is the total number of active and healthy spermatozoa in the full ejaculate that makes a semen fertile or infertile. My investigations, confined to infertile men, have shown that the smallest volume was 0·4 c.c. and the largest 9·0 c.c. It has to be borne in mind that the quantity of semen ejaculated depends to a great extent on the period of continence and the person's sex activities. The ejaculate is naturally less when repeated coitus are indulged in. Then again, continually indulging in flirtations and similar other sex activities increases the secretions of the prostate and seminal vesicles which means the volume of semen is more. Similarly, an emotionally satisfying coitus will empty these structures of their secretions more thoroughly than an unsatisfactory coitus or masturbatory act. I do not believe in the myth that sexual excesses bring on *permanent* infertility or impotence.

There are also cases where the man discharges no semen at all. The possible causes for this condition are stricture of the urethra or obstruction in the ejaculatory ducts, sexual infantilism, paralytic impotence and psychic inhibitions. Obstructions in the urethra and ejaculatory ducts are rare and sexual infantilism can be easily diagnosed. In paralytic impotence which is a temporary condition, there will be a history of recent sexual excesses. The commonest cause is some psychic inhibition which prevents ejaculation after coitus. There may be a small

quantity of discharge which consists of the secretions of the urethral sex glands which the man believes to be semen. When psychic inhibition is the causative factor, patient questioning will elicit the fact that he gets nocturnal emissions often the same night he has had coitus and that these and those after masturbation (if the practice is indulged in) differ from that ejaculated after coitus. I have noticed two such cases. There are also cases in which the man cannot ejaculate semen through nervousness when he indulges in coitus in the bacteriologist's rooms. An experienced bacteriologist can determine, however, whether the discharge produced for examination is really semen or composed of the secretions of the urethral glands.

The semen is viscous or of the consistency of thick cream on discharge and liquefies on standing. Failure to liquefy may impair sperm motility. Very thin semen is usually infertile and the consistency can be improved by attention to general health and a nourishing diet, when not due to diseases of the prostate gland or seminal vesicles. Treatment for oligospermia is necessary only when the quantity is say below 1·5 c.c. or when the sperm count is poor.

DEFECTS IN SPERMATOZOA AS REGARDS QUANTITY AND QUALITY

It was once believed that a fertile sample of semen should contain about 100,000,000 spermatozoa per c.c. The present belief is voiced by Kreutzmann (1940). He writes, "The work of Hotchkiss has shown that the previous concept of men being sterile, if the count is below 60,000,000 per c.c. is incorrect. In his work on 200 men whose wives were pregnant, Hotchkiss found counts as low as 2,250,000 per c.c. and in 25 per cent of men the count was below 60,000,000." In one of my cases, the wife of the man whose sperm count was only 3,333,000 became pregnant. She conceived three times but on all occasions aborted at the tenth week. In another of my cases, the semen showed a count of 420,000,000 per c.c. and yet his wife did not conceive, though there were no apparent signs of infertility in her. Such cases are very common. This, together with the fact that only one sperm is required for fertilisation, forces us to the conclusion that many factors regarding sterility are still unknown.

The sperm content in a sample of semen should be considered along with their motility and longevity and the number of abnormal forms present. As regards motility, in hundreds of semen reports before me, all of infertile men, it varied from nearly all being motile to complete absence of motility. Some clinicians assert that a specimen of semen containing less than 20 per cent of motile sperms is to be considered as infertile. I think fertility or otherwise of a sample of semen should be calculated on the total number of motile sperms present in the whole specimen. A sample of 5 c.c. of semen, each c.c. containing 200 million sperms out of which only 20 per cent are motile will be more likely to be fertile than another of 2 c.c. and each c.c. containing only 20 million of sperms even though all of them are motile.

The relation of longevity of sperms to fertility is more difficult to decide. Sperms that may remain viable for twenty-four to forty-eight hours in the laboratory may cease to be so within a few minutes or hours in the genital passages of the female due to various causes, such as high vaginal acidity and so on. That is why some clinicians advocate examining the semen taken from the vagina after coitus at varying intervals. It may however be assumed that sperms which remain viable for six to twelve hours in the laboratory may be considered as fertile, provided other factors are favourable. The number of abnormal sperms, according to Moench, should not exceed 19 to 20 per cent. He assumes that fertility is impaired when abnormalities reach 20 to 22 per cent, and that clinical sterility is usually present if more than 25 per cent abnormal forms are found. This is admitted to be true by almost all workers, though no one explains why it is so.

Azoospermia may be true azoospermia or pseudo-azoospermia. In true azoospermia, there will be no sperms in the semen discharged and also in the fluid aspirated from the testicles. In pseudo-azoospermia, normal sperms will be present in the testicular fluid but not in the semen discharged. The commonest cause of this condition is some obstruction or occlusion in the epididymis, vas or ejaculatory duct. To diagnose obstruction means elaborate investigations. A case should not be diagnosed as azoospermia unless examination of the fluid aspirated from the testicles has been carried out. Psychic inhibition as a cause of oligospermia which also means azoospermia has already been mentioned. Such cases should also be included under the term pseudo-azoospermia.

The treatment of pseudo-azoospermia consists in removing obstructions in the seminal passages or psychic inhibitions whichever may be the causative factor. The most difficult condition to remedy are bilateral obstructions, situated in the epididymis. In such cases it is evident that treatment with hormones will be of no avail. The operation of epididymovasotomy is recommended but this has proved unsatisfactory even in the hands of the most experienced urological surgeons.

No known line of treatment has proved effective in true azoospermia. In twenty-six such cases that consulted me, I tried at the patients insistent request, every possible combination of hormones without effect. This has been the experience of other workers as well. Weisman (1943) says: "While it is hoped that prevention of damage to the genital system will in the future lessen the number of barren marriages, we are faced now, and will undoubtedly be faced in the future, with some men who are absolutely sterile and are unable to procreate. Let us be frank and ask ourselves what can be done for the following list of unfortunate men whose semen reveal complete absence of spermatozoa." Here he gives a list of the causes for this condition and concludes thus: "Can we stimulate spermatogenesis where it has faltered? It is almost universally agreed that in azoospermia, endocrines and the like have failed miserably in the treatment of deficient spermatogenesis. Is there anything that we can, at the present time, offer to the male who suffers with complete azoospermia?" As nothing can be done for such men, Weisman rightly suggests as the only possible remedy artificial insemination with donated semen.

TREATMENT

From what has been written, it should not be assumed that all cases of infertility are difficult to diagnose or remedy. In many cases, simple instructions as regards coital technique, fertile days in the menstrual cycle, a well-balanced diet and improving the general health will bring on the desired result.

Before explaining the line of hormonal treatment that has proved most effective in my hands, a few words about the physiological actions of the various hormones may be said. It was mentioned that the endocrine glands believed to affect fertility are the testicles, the anterior pituitary and the thyroid. The thyroid affects basal metabolism which in some way affects fertility. Beyond this, nothing is known to connect it directly with spermatogenesis and whenever its products are administered, it is done empirically.

The anterior pituitary is believed to influence spermatogenesis through the gonads but independently of the male hormone. How it does so is not clearly understood, except by assuming that it is by stimulating the gonads. While there are clinicians who advocate the use of anterior pituitary and gonadotropic hormones as a routine measure in all cases of defective spermatozoa and semen, there are others who find these utterly worthless and prefer instead the testicular hormone. I use his hormone in combination with the follicular hormone.

It was mentioned that the testicular hormone is essential for spermatogenesis because it maintains the seminiferous tubules, epididymis and accessory sex organs in a healthy condition. The hormone also controls the secretory activity of the latter. The role of the follicular hormone is not clear. In my previous publications, when I advocated the use of this hormone in anæsthetic types of sexual impotence, I wrote that it induced marked hyperæmia of the sex organs and increased considerably the secretory activity of the accessory sex organs. This would explain the increase in the volume of the semen in cases of oligospermia. As regards oligozoospermia, it is not clear whether the hyperæmia which the follicular hormone induces is alone sufficient to increase the spermatogenic activity of the seminiferous tubules or whether this takes place through the intermediary of the anterior pituitary gland. Possibly the follicular hormone affects spermatogenesis in both ways. Be that what it may, I have always found the combined treatment with testicular and follicular hormones more effective in defective conditions of semen and spermatogenesis than with the testicular hormone alone. I have not come across any studies where the follicular hormone has been used in these conditions. Cases with identical semen pictures as regards volume and the number of spermatozoa per c.c. were treated with the testicular hormone alone and with a combination of this and the oestrogenic hormone. The results were very much more marked with the latter line of treatment.

As regards the doses, I find that the hormones when used in smaller doses give better results than when used in large doses, the exceptions being cases of sexual infantilism. This is the opinion of Kreutzmann (*loc. cit.*) as well. He writes: "At the present time testosterone propionate is the androgen most frequently used by physicians in the treatment of both impotence and sterility. Heckell and McCullagh and McCurl have shown that this drug used in doses of from 25 to 50 mg. caused a decided decrease in the number of spermatozoa. However, according to the observations of Rubinstein and Kurland the administration of small doses of testosterone, 5 mg three times a week, caused an increase in the number of sperms. In view of the harm that may occur, the indiscriminate injection of endocrine products should be stopped. One should be especially cautious in the use of large doses over long periods of time as the pathologic changes in the sperm may be increased by such treatment."

I use 10 mg of the testicular hormone in combination with 1 mg. of the oestrogenic hormone given twice a week in oligospermia, and half the above dosage in cases of oligozoospermia. The number of injections required would depend on the improvement noticed in the sperm picture. What is usually done is to continue the treatment till the sperm count and sperm motility come up to nearly the accepted standard and then put the patient orally on vitamins E and the B complex. The improvement is often kept up and no further hormonal treatment will be necessary. In some cases however improvement is noticed only as long as the treatment is kept up and these are the cases where asthenia or other constitutional disorders are present. Often no explanation can be given for the discrepancy between the two types of cases. In milder defects of the semen and spermatozoa, I give short courses of hormonal treatment every month. This means two or three injections every month starting about a week before the expected ovulation day in the menstrual cycle of the female partner, say on the 6th, 9th and 12th days of the menstrual cycle. This is suitable in cases where the sperm count is fair but motility is poor, the idea behind the treatment being to temporarily activate the spermatozoa. The treatment may have to be repeated for two or three months but is economical to the patient.

In some of my cases, patients complained during the combined treatment of tenderness and enlargement of the nipples and in three cases, distinct lumps were noticed in the breasts. This can be prevented by using the follicular hormone in the proportion of not more than one in ten of the testicular hormone. No other signs of feminisation or depressional effects on libido or sexual potency were noticed. For lack of space, no cases are described in this paper.

SUMMARY

The cause of infertility is some defect in the semen and spermatozoa which is brought on more commonly by factors other than endocrinal, such as constitutional diseases, extrinsic poisons and so on. Endocrinal infertility is seen only in sexual infantilism, total or partial. The latter is more difficult to diagnose. As these factors do not produce impairment of sexual potency, treatment for infertility is sought for late in life.

The defects in semen and spermatozoa are produced by damage to the epithelial cells of the seminiferous tubules. Prognosis would depend on the extent of the damage. This can be gauged to some extent from the semen picture but often possible only by the effects produced by treatment. The first essential is to correct constitutional disturbances and nutritive defects. The hormones found most effective are the testicular and follicular hormones, given in small doses. When the damage is considerable, as in azoospermia, no line of treatment is effective and a plea is put forward to physicians to guard against possible genital complications during constitutional diseases by appropriate measures, such as administration of vitamins E and the B complex, during the active and convalescent stages of these diseases.

ACKNOWLEDGMENT

Some of the facts and cases given in this paper were first published in my book, Disorders of Sex and Reproduction in the Male. The testicular and follicular hormones used in this study are Perandren and Ovacyclin B and P, both preparations of Messrs Ciba (India) Ltd. I acknowledge my indebtedness to this firm for keeping a liberal supply of these products at my disposal.

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THERAPEUTICS OF BACILLARY DYSENTERY

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Introduction

Till very recently, the sheetanchor of treatment of bacillary dysentery was saline. But as saline was not specific, the prognosis used to be very uncertain and in many patients inspite of all efforts of the physician, convalescence, with consequent invalidism was prolonged. Hence the discovery of the effectiveness of the sulpha group of drugs in intestinal bacillary infections was welcomed with natural jubilation.

With the progress of the chemistry of these group of drugs, various new drugs, specific for various group of infections have been found out and so far as the intestinal bacillary infections are concerned, sulphaguanidine is the drug of choice. But it has two great disadvantages: (1) it is rather costly, (2) the dose required is a large one, 20 - 30 tablets a day. But sulphapyridine, though a little bit more toxic is much more effective, the results are almost dramatic, the cost is less, and the dosage is also small. Hence sulphapyridine was used as a routine measure sometimes with and sometimes without serum according to the type and severity of the symptoms.

Clinical Materials

Type of Cases: Altogether 237 cases were treated in this series. These were diagnosed partly bacteriologically (164 cases) and partly clinically (73 cases). Of 164 cases bacteriologically diagnosed, 44 were infected by Shiga's bacillus, 103 by Flexner's bacillus, 9 by B. Schmitz, 2 by B. paratyphosus B, 2 by Sonne's bacillus, 1 by B. pyocyaneus and 3 by B. alkaligenes faecalis.

The 73 cases diagnosed clinically as bacillary dysentery were further confirmed by a microscopical examination of the stool but no cultural study was possible for lack of facility.

Analysis of the Cases

Two cases due to B. paratyphosus B were afebrile and complained of diarrhœa with blood and mucus in the stools of 6 to 8 week's duration. Stools were acid in reaction to litmus paper, with an indefinite exudate showing altered red blood corpuscles and white blood corpuscles, a few macrophages and a large number of motile bacilli.

Two cases due to B. Flexner complicated typhoid fever (blood culture positive) by a sudden diarrhœa with blood and mucus in the stools.

Three cases due to B. alkaligenes fæcalis had diarrhœa with mucus and traces of blood in the stools. They ran a febrile course, and blood culture was positive for B. alkaligenes fæcalis. There was in addition severe spasmodic bronchitis, flushing of the skin, vomiting and remittent temperature lasting 16 to 23 days.

Seven cases showed a combined infection by amœbæ and B. Flexner.

Three cases of Flexner type and 1 case of severe Shiga type of dysentery, were pregnant women of over eight months gestation.

Thirteen acute cases, 3 Shiga type and 10 of Flexner type, were associated with lobar pneumonia.

Seventeen cases, 12 of Shiga type and 5 of Flexner type, were of the choleraic type. Three Shiga type of cases had acute dilatation of the stomach and paralytic ileus, and were intensely toxic.

Fifteen cases, 4 Schmitz and 10 Flexner and 1 Flexner combined with amœbic—were chronic cases, and had three to eight attacks of dysentery in previous 2 months to 2½ years. Two of them had megacolon as a result of chronic dysentery, and 1 had prolapse of the rectum. They were all very anæmic with hæmoglobin between 35 to 55 per cent. Six had vitamin B_1 deficiency, 3 nicotinic acid deficiency, 1 riboflavine deficiency, and 2 had calcium deficiency with tetany.

All patients were between 12 and 38 years of age, except 3 over 60 years.

Treatment

For treatment the cases were grouped under three heads:

A. *Diarrhœic cases with blood and mucus in the stools, with little or no toxic symptoms and no dehydration*—M. & B. 693 was used. Relatively small dosage was required. As a routine 4 tablets were given stat, and 2 tablets repeated 4 hourly, with alkaline mixture oz. 1-2 (sodium citrate drachm 1 to 1 ounce of water) to keep the urine alkaline, for four days; total dosage 50 tablets. In milder cases the dosage was reduced to half during the third and fourth days. In a few cases who took about 72 hours to respond to treatment, the latter dosage was continued on the fifth and sixth days of treatment, to prevent relapses.

Relief was obtained in 24 to 48 hours, this period seldom extending to 72 hours. The stools rapidly inproved and obstinate constipation followed as a rule. In case a dose was vomited out, it was repeated, and in no case was the drug given parenterally.

The diet did not require any strict control. The majority of the patients tolerated milk from the beginning, and rapidly took to their full meals after the fourth day of treatment.

B. *Severe and toxic cases with dehydration*—M. & B. 693 was used in the same dosage as in group A.

Antidysenteric serum was injected intravenously in a single dose of 100 c.c., and repeated in six to twelve hours if the response was not adequate.

The initial severe diarrhœa was checked by chlorodyne 60 minims, repeated half-hourly in 30 minim doses, twice or thrice or more, if necessary. No adverse results were noted from the use of this drug. It was very valuable in tiding over the patient from the unnecessary dehydration, before the constipating effect of M. & B. 693 came into play.

Intravenous normal saline was rapidly infused. The value of this rapid infusion is stressed at least in the beginning as in the badly dehydrated cases speed was essential to restore the blood volume to prevent central circulatory failure, and also retard the onset of peripheral circulatory failure from toxæmia, both of which may come on with marked rapidity. It was repeated as often as necessary so long as the vomiting and diarrhœa continued. There was no law for the time interval after the previous infusion, or its amount. To give an illustra-

tive example; fifteen pints of normal saline were infused in a choleraic type of case in six hours, and the patient was saved. Atropine gr. 1/50 was added to the infusion, and in no case was any œdema of the lungs recorded.

By using a series of controls in dehydrated cases it was found that normal saline was far superior to hypertonic saline or glucose saline. In the latter cases it was difficult to infuse the adequate amount of fluid without embarrassing the circulation; respiration became difficult, the jugulars were distended, and in the badly dehydrated cases changes in the red blood cells were inevitable as apparently the tissues could not supply the water for its dilution. A larger amount of normal saline was more beneficial than a smaller volume of hypertonic saline or glucose saline. The case illustrated above is only one example. Glucose was better given separately, and doses of 100 c.c. of 25 per cent solution were used, repeated, if necessary.

To combat acidosis in cases with deep or irregular respiration, 150 c.c. of a freshly prepared 4 per cent sodium citrate solution was added to the saline infusion.

Oliguria was combated by the saline infusion with 100 to 200 c.c. of 25 per cent glucose solution, 150 c.c. of 4 per cent sodium citrate solution, and 200 to 500 mgm. of vitamin C as useful adjuncts.

Threatened anuria or anuria was treated by flushing the kidney with the above infusion, with an additional pint of 4·285 per cent sodium sulphate solution, repeated if necessary in 2 to 4 hours.

Vomiting was controlled with the atropine given in the saline infusion, and by the chlorodyne given for diarrhœa, the latter especially if iced.

Severe persistent vomiting and diarrhœa was due to calcium deficiency in 8 cases, and acute adrenal insufficiency* in 2 cases resulting from intense toxæmia, and was treated accordingly with calcium gluconate 20 c.c. of a 10 per cent solution repeated 4 hourly or even earlier, and by eucortone 30 c.c. repeated 6 hourly respectively, both given by intravenous injection.†

1. Abdominal distention associated with severe colicky pains was relieved by atropine gr. 1/50 given intravenously and repeated, if necessary.

2. Abdominal distention resulting from severe spasm of the rectal sphincter especially found in the moribund cases was treated with a cocaine-morphia suppository and a rectal tube; starch and opium enema was less satisfactory and was often a failure.

3. Three cases were recorded where abdominal distention was due to acute dilatation of the stomach and paralytic ileus, resulting from intense toxæmia. Antidysenteric serum 200 c.c. was the initial dose and repeated in 6 hours. Stomach was initially aspirated and 4 to 6 pints of fluid withdrawn. Pituitrin 1 c.c. was given intravenously every two hours and a rectal tube passed. It was found that turning the patient to his left often relieved the distention better than the rectal tube.

4. Slight distention of the abdomen may arise from the use of atropine or chlorodyne.

5. One case of intussusception of the small intestine was recorded and treated surgically under local anæsthesia.

The abdomen was kept comfortably warm by turpentine stupes or flannel binders to the abdomen in all the cases.

Diet. Rigid control was not found to be necessary. In the first 24 hours water, normal saline, lime juice, tea, coffee were all given. A very useful drink retained by many patients with vomiting was made of glucose dr. 2 sodi bicarb dr. 1 and lemonade or ice cream soda bottle 1. After 24 hours the patients were treated as in group A.

C. *Relapsing and chronic cases*—These were treated as follows:

1. By one to three courses of M. & B. 693, as in group A, but half the dosage was prolonged for a further period of 4 to 6 days after the first 4 days of treatment.

2. If (1) was not successful, a course of M. & B. 693 was accompanied by intravenous injection of antidysenteric serum, 50 to 100 c.c. daily.‡

3. Cases with amœbic infection were given emetine gr. 1 daily, 12 doses, in addition to the above treatment.

Nicotinic acid 300 to 600 mgm. was given daily to all patients. Anæmia was treated with two Fersolate tablets, vitamin B_1 5 mgm, vitamin C 50 mgm., three times a day accompanied in some cases by injections of crude liver extract as a useful adjunct. Calcium deficiency was combated with Ostocalcium (sodium calcium lactate with Vitamin D.) 2 to 4 tablets, t.d.s.

Results

1. All the cases in the series were successfully treated.||
2. Relapses two to three occurred within 10 days in 3 cases of B. Schmitz and 5 cases of B. Flexner dysentery.
3. There were no carriers after the treatment was completed.¶
4. Convalescence was rapid.

Conclusions

1. Treatment with M. & B. 693 in mild cases, and M. & B. 693 and antidysenteric serum in severe and toxic cases, gave definite and absolute curative results.
2. Normal saline intravenously was found to be better than hypertonic saline or glucose saline to combat dehydration.
3. This treatment proved itself of special value in bacillary dysentery with lobar pneumonia, pregnancy, enteric, and amœbic dysentery, conditions in which treatment with salines by mouth was contraindicated.
4. Rigid control over diet was not found to be necessary. This was a very advantageous factor, apart from difficulty in procuring special diets, as the convalescence was rapid.
5. Relapses were rare, 8 in 237 cases of all types.
6. Treatment with salines by mouth was discarded in this series.

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* The writers do not mention the methods of investigation which led them to conclude that there was co-existent calcium deficiency and adrenalin isufficiency.—Editor.

† The cost of such heavy doses of eucortone is prohibitive to its use. Further, the use of such heavy doses is rarely indicated—Editor.

‡ The wisdom of using antidysenteric serum intravenously in chronic cases may not be appreciated by all—Editor.

|| The writers do not specifically mention about mortality. We may naturally presume this was nil in this series—Editor.

¶ The writers do not give the details of the methods of detection of the carrier state—Editor.

CASE NOTE

ACUTE LEPRA REACTION IN COURSE OF THYROID MEDICATION FOR OBESITY

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The following case-history suggests the possibility that leprosy may manifest itself in an unexpected and acute way as against the usual insidious and slow onset:

A Muslim lady, aged about 36, belonging to upper middle class, consulted the physician for gradually increasing obesity. She desired to reduce her size and weight. Her height was 5 ft 1 inch and weight 156 pounds. The physician noticed some evidence of myxœdema, *i.e.*, non-pitting œdema, dry skin, etc., but her mental alertness was quite sound. He administered thyroideum 1 grain three times a day. No B. M. R. was done at the start. The patient continued to take thyroideum for about three weeks when she developed slight discomfort with breathlessness. The physician advised her to continue the thyroid tablets despite the symptoms and the symptoms disappeared after some time. She had been taking thyroid regularly for about seven weeks and was pleased to note that her size had reduced and the figure was getting more proportioned. She had lost during this period from 25 to 30 pounds. After about two months of taking thyroid she felt a peculiar tingling sensation in her forearm, more on the dorsal aspect (outer). The tingling developed into aching pains and rapidly there appeared on the outer aspect of both the arms papular rash. She was then referred to the dermatologist who prescribed dusting powder and aspirin. The papular rash got nodular and extended up to the arm above the elbow, but mainly confined to the outer aspect, though extending inwards. The palliative treatment of 'aspirin and dusting powder' had no effect. The face now got dusky and a bit glistening. At this stage she was down with fever for about a week and being an out-door patient, nothing was watched during this period. She came back to the Dermatology Department after the subsidence of the fever. The nodules showed no sign of arrest. Rather, on the dorsum of both the feet she showed thickened raised patches with "funny" sensation. One of the nodules from the forearm was excised and sent for biopsy to the bacteriologist. The result was "positive for mycobacterium lepra."

After about two weeks a nasal smear and another nodule-smear were sent and the result was: "Mycobacterium lepra found in plenty in both smears."

DISCUSSION

The physician who first treated the patient for obesity did not notice any evidence of leprosy. Possibly a detailed search was not made as there was no suspicion. Even after the eruption made its appearance it was not taken note of, as skin eruption have sometimes accompanied thyroid therapy. Obviously the leprous infection was not acquired during the period of treatment in the light of the recognised incubation period of leprosy. The question of interest then is 'Did thyroid therapy bring to surface a latent leprous infection or did it exaggerate it?' Several essential tests including accurate physical examinations were not done as the patient, being fairly well informed was kept off the surprise of leprosy deliberately though one should confess that the hush-hush attitute provoked her curiosity and delayed the antileprosy treatment.

Whether the fever during the period she was under observation for the nodules on the forearm, was leprous reaction, one is not certain. (A sedimentation index at that time would have given some idea). Potassium iodide in small doses, *i.e.*, 1 gr. has been known to produce reaction in lepers with the appearence of fresh lesions and discharge of lepra bacilli sometime from the nasal discharges. Has thyroid medication acted like iodide administration? Did the burning up of the subcutaneous reserves of fat and protein release the lurking lepra bacilli into general circulation for rapid multiplication and come to the surface? Did the dehydration of the tissues by the thyroid bring about the effect? It is said that sometimes the first manifestation of leprosy is by an acute reaction, as though it is an eruptive fever, where the provocative of the reaction is not quite obvious. Is it possible that this was one such, altogether independent of thyroid therapy? These are some of the unanswered doubts raised by the case.

(*Continued from page 67*)

I would further suggest that medical graduates might submit thesis on their studies on Ayurveda for M.D. or PH.D. examinations; and that the study of the history of Ayurvedic medicine should be included in the history of medicine which forms a part of the examination for the degree of Doctor of Medicine. It is also a matter for consideration whether a Chair on Ayurvedic Medicine could not be established in the medical colleges for post-graduate study and examination.

TIME AND PLACE OF ANNUAL CONFERENCES

Before I conclude I have one suggestion to make for the consideration of the Specialist Associations, namely, whether it would not be more helpful if the annual conferences of such all-India organisations and that of the Indian Medical Association are held at one place and during the same week. A great deal of advantage will accrue to the medical profession in general and to the members of the specialist organisations by such co-operation. It would also lead to saving of much time and energy for such members who are interested in the Indian Medical Association as also in one of the Specialist Organisations. Such co-operation would also facilitate the publication of a Journal by the combined efforts of the members of two or more Specialist Associations as it has not been possible for all such individual organisation in this country to start a Journal of its own.

Friends, I have said enough for the day. We shall soon be considering the constitution of the Association and the rules to be framed thereunder. They will give an idea as to what the function of the organisation, which we are launching today will be. The policy of our Association will be, in the words of my friend, Lt.-Col. K. G. Pandalai,—which he uttered at the time of the inauguration of the Association of Surgeons of India over five years ago,—"one of toleration and friendship to all. We have no politics except that we wish the name of our country to stand high among other nations. We shall attempt to educate the public in measures for the saving of life and avoiding human waste. We shall work in the direction of promoting higher education of the medical profession by providing facilities for better post-graduate education," and for, if I may add the words, "Medical Research."

With these words, Ladies and Gentlemen, I have great pleasure in inaugurating the Association of Physicians of India; and I hope and pray that our deliberations and discussions this year as well as in the coming years may be fruitful in their results, and lead to the relief of human suffering in this much distressed land.

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CALCUTTA, DECEMBER, 1944

MALARIA IN BENGAL

In 1942, after the fall of Java we drew attention[1] to the consequences of the outbreak of malaria in view of shortage of quinine in the country. We showed that the 70,000 lbs. of quinine produced in India, was only about a third of our real needs, and how the recommendations of the Royal Commission of Agriculture were shelved only to be eaten by white ants. Later we suggested[2] equitable and proper distribution of available quinine, encouragement of the manufacture of other antimalarial drugs like mepacrine hydrochloride in India combined with intense public health measures to fight malaria in the highly endemic area. Very little progress has been made since our remarks. It required the Bengal Famine and subsequent flaring up of malarial epidemic throughout the province, to make the authorities stir in their cosy cushions and look round. Recently we commented[3] upon the serious epidemics of malaria, small pox and cholera, which were raging in the country.

In this connection, in course of an amazing statement in the Bengal Legislative Council, Hon'ble Khan Bahadur Saiyed Muazzemuddin Hossain said "During the first five months of this year 24,59,862 persons suffering from malaria attended hospitals and dispensaries all over Bengal. The incidence of malaria has increased much since July last". He quoted figures to show that quinine and other antimalarial drugs had been distributed on a "much larger scale" this year than last year and added "Government has done what is humanly possible to do. We can not do more than that". He admitted the situation was serious and explained "Government has no hands in the increase of malaria because it comes from above". Need he be told that it was humanly possible for all civilized countries to check malaria and it does not come from heaven but from the stagnant pools and dying rivers of the province due to lack of irrigation and almost non-existent public health measures?

Commenting on the supply of antimalarial drugs Roy[4] released a statement to the press in which he remarked "I admit that antimalarial drugs mostly in the form of mepacrine and quinacrine are available to-day in larger quantities than it was six weeks ago. But there need be no jubilation over this piece of information when we recall that the need for these vital drugs in Bengal alone is far more than that in the whole of India of prewar days. Supply of quinine is extremely low in most of the districts and altogether absent in others."

Within the last few months malaria has increased in Calcutta and the surrounding areas in alarming proportions. This has affected not only the poor working classes but every one high and low. The workers in different industries have not escaped. The employees of most of the commercial firms have been heavily affected. Several factors are responsible for the present state and unless steps are taken to find out the various causes responsible for the epidemic and immediate steps taken for its control, things will be worse still and may have a serious repercussion on both the civil and military personnel. For instance, it is not at all improbable for the epidemic to spread amongst the industrial population in and around greater Calcutta. If this unfortunately does happen and there is no indication yet to check it, except the onset of cold weather, there will be partial or complete dislocation of work of all industries with terrible consequence on war production. We must not forget that "in the distant past it has caused the decay of empires and in the near past the failure of the best conceived military campaigns, in our own times it has led to the abandonment of many engineering projects and has delayed innumerable others"[5].

In the year 1931, apprehending a possible invasion of Calcutta with *Anopheles Ludlowii*, a deputation waited on the Governor of Bengal drawing his attention to the serious danger which then threatened Calcutta. As a result Brigadier G. Covell I.M.S. of the Central Malaria Bureau was commissioned by the Bengal Government to make a survey of the whole situation and recommend such measures as may be necessary. As a result a Special Committee (Ludlowii Sub-Committee) was formed to watch the situation from day to day. This committee did some valuable work but unfortunately the local Government abolished this committee early in 1935. The Control of Ludlowii in the Salt Lake area was exercised by the Government of Bengal and for a number of years upto 1935 or thereabout the Calcutta Corporation contributed Rs. 10,000 annually to the Government for carrying on measures for the prevention of breeding of Ludlowii. Since then the Corporation contribution has been disocontinued on the ground that the Corporation was not willing to pay for temporary measures. But no permanent measures were undertaken, for instance, reclamation of the Salt Lake area. It appears now that most of the mosquitoes responsible for the present epidemic are breeding near about the Salt Lake area and if the vigilance was maintained, this disaster might have been averted.

This situation in Calcutta has been discussed at length only to show that similar factors are responsible for the seasonal outbreak of malaria everywhere. There are very few lacunæ in our knowledge about the treatment and control of this disease. Vast amount of literature dealing with the preventive aspect of the disease has accumulated. Protection of human lives against epidemics is the duty of the State and it should put in action all the machinery against them at once. If the epidemic of malaria gradually wanes due to the onset of cold weather, let precautions be taken to fight it at its next outbreak.

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[1] Editorial—*J. Indian M. A.*, **11**:280, 1942.
[2] Editorial—*Ibid.*, **12**:126, 1943.
[3] Editorial—*Ibid.*, **13**:232, 1944.
[4] Roy, B. C.—*Amrita Bazar Patrika, Town Edition*, Oct. 1, 1944.
[5] Napier, L. E.—The Principles and Practice of Tropical Medicine, Part I, Thacker Spink & Co. Ltd., Calcutta, p. 54, 1943.

CURRENT MEDICAL LITERATURE

Protein Deficiency in Surgical Cases

Myer and Koroll (*Surg. Gynec. & Obst.*, **78**:181, 1944) from the study of plasma protein in 278 surgical patients and of the influence of surgery on the plasma protein levels observed in 193 of these state that hypoproteinæmia is a common result of surgical disease as such as well as the result of operative procedures which drain the protein deposits of the body. Hypoproteinæmia is found most frequently in bleeding peptic ulcers, carcinomas of the gastrointestinal tract, bowel obstruction and intestinal fistulas and this hypoproteinæmia is aggravated by surgery in these conditions but markedly improved if intensive therapy is employed *e.g.*, by administration of liberal amounts of blood, blood plasma and aminoacids. Of 32 fatal cases 18 showed hypoproteinæmia either before or after surgery. Whole blood seems to improve the condition more than plasma due to the value of hæmoglobin as a protein carrier. The combination of aminoacids and whole blood as a means of treating hypoproteinæmia warrants further use. The authors suggest the daily observation of the total protein, hæmatocrit and hæmoglobin as an aid in determining whether whole blood, plasma or dextrose and/or saline solution meets best the patient's requirements.

The Nutritional Care of Cases of Extensive Burns

Tui and others (*Am. Surg.*, **119**:815, 1944) deal with the nutritional care of three cases of thermal third-degree burns of, respectively, 10, 30 and 50 per cent of body surface. The patients were given high caloric and high nitrogen feedings in the form of dextrimaltose and amigen, an aminoacid preparation. The nitrogen balance was followed, for a varying period of time, throughout convalescence and the plasma proteins and body weight were determined periodically. All three patients were maintained in excellent nutritional state. There seemed to be a mathematical relationship between the extent of surface burned and the amount of nitrogen required to maintain nutrition. Transfusions were reduced to a minimum. Preparations such as amigen seem to be better tolerated and utilized than natural protein food and appear to be the solution to the problem of nutritional care of severe cases of protein drain. The authors hope that it will be possible to work out a practical formula of amino-acid feeding for burns of different extent.

The development of shock following immediately upon the first skin grafting which was observed, in one of the reviewed cases, is a phenomenon which may have an important bearing on the safety of this procedure in cases of extensive burns. Theoretically, it is to be expected that in patients undergoing severe protein loss with protein synthesis bareley keeping up with the loss, the opening up of new areas of the skin surface, with resulting increase in exudation and bleeding, would readily lead to the development of shock. If this explanation is correct, then patients in this condition should have no skin grafting attempted unless the protein nutrition has been improved and measures for the therapy of shocks are at hand.

Podophyllin Treatment of Condylomata Acuminata

Culp and others (*J. Urol.*, **51**: 665, 1944) write that podophyllin has been found to be unusually successful in producing prompt and complete disappearance of condylomata acuminata regardless of the size, number, location or duration of growths. It is generally agreed that circumcision alone will not prevent occurrence or recurrences of penile lesions. This was supported by four cases in this series. Podophyllin may be applied locally to the lesions as a 25 per cent suspension in mineral oil or as a paste composed of the powdered drug and water. Anæsthesia is not required. Treatment is simple, the convalescence usually is painless, and the lesions disappear within two to three days after a single application, leaving no ulceration or scarring. Repeated applications of the drug may be necessary in a few instances. Only rarely will there be any time lost from full military duty or similar physical activity.

The surrounding normal tissue usually is unaffected by the drug but in isolated cases of extensive application under tight prepuces some balanitis may result. Occasionally circumcision will be advisable because of the chemical balanitis and secondary prepucial œdema but disappearance of the condylomata simplifies the surgical procedure. The dramatic results obtained in this series of 100 cases and the simplicity of the treatment with podophyllin prompt the authors to recommend more widespread application of this type of therapy.

Hydronephrosis as a Cause of Backache

Mallam (*Lancet*, **2**:2110, 1944) writes that congenital dilatation of the renal pelvis is a more common cause of backache in youngmen that is sometimes recognised and may also give rise to abdominal pain thought to be of extrarenal origin. No obscure cases of high backache is to be regarded as fully investigated until a pyelogram has been done. In 11 out of 12 cases in soldiers operation was successful in relieving pain.

The Treatment of Gas Gangrene

The Army Medical Department has issued to every medical and dental officer a bulletin laying down the treatment to be followed in the light of the important experience gained in the present war. Gas gangrene may follow trivial injuries but is most likely in cases of interference with the main blood supply of a limb, buttock or shoulder, compound fracture of the long bones, especially of the lower limb, foreign bodies carried deeply, prolonged application of a tourniquet or tight packing, application of a tight plaster or even a tight dressing to an inadequately excised wound and delay in surgical treatment. In all such cases the following prophylaxis is laid down: Polyvalent gas antitoxin 22,500 units, with the usual dose of tetanus antitoxin, should be injected intramuscularly in forward medical units, but when intravenous administration is practicable it is preferable. The usual sulfonamide medication should be followed both locally and by mouth. But wound excision is the most important prophylactic and should never be unnecessarily delayed.

If gas gangrene is established, speed is essential to save life. Preoperative measures consist of (1) a dose of 60,000 units of polyvalent gas gangrene antitoxin given intravenously by syringe (if the toxemia is very severe 100,000 units should be given); (2) sulfathiazole 3 Gm., which may be given during transfusion and (3) transfusion of 1 or 2 pints of blood. Occasionally blood may be contraindicated; in such cases, or if blood is not available, plasma may be given. As a general rule if the patient is too ill for operation he is unlikely ever to be in a better condition than following administration of 100,000 units of antitoxin in 1 or 2 pints of blood.

Removal of the infection by complete excision of the affected tissues is essential. Amputation is by no means a

routine necessity, though frequently it is inevitable because of vascular damage. Where only one muscle or one group of muscles is involved, that muscle or group should be extirpated from origin to insertion. Great care must be taken not to damage the blood supply to adjacent muscles. If radical surgery is impossible, either because of the site of infection or because of the condition of the patient, the muscle sheaths and muscles must be freely incised to relieve tension and intensive therapy with antitoxin and drugs pursued. The best anesthetic is a small dose of pentothal sodium followed by nitrous oxide and oxygen. Chloroform and ether must be avoided. From necessarily limited experience it seems that penicillin will prove of great value in the treatment of gas gangrene. The initial dose should be at least 30,000 units of sodium penicillin intramuscularly. Three hours later it should be given at the rate of 5,000 to 6,000 units by intravenous drip.—*J.A.M.A.*

Roentgenologic Features of Mediastinal Tumors

Robbins (*Radiology,* **43**:115, 1944) writes that with the present methods of rœntgenologic examination no exact differential of mediasatinal tumors is possible. Certain diagnostic features in various types of tumor have been demonstrated, however. The most important of these are as follows: *Congenital tumors:* Bronchogenic cysts—A round or ovoid tumor located in the anterior mediastinum without evidence of calcification or bone erosion. Dermoid cysts and teratoma —A mass, slightly more irregular in outline, located in the anterior mediastinum, which may contain foci of calcification. *Neurogenic tumors:* Any one of these tumors is usually smooth in outline, homogeneous in density, and may be located in any portion of the mediastinum; bone erosion (contradistinguished from bone destruction) is commonly associated with this type of tumor. *Tumors of thyroid, parathyroid and thymic origin:* The outstanding finding in intrathoracic goiter is its attachment to the trachea; parathyroid and thymic tumors may be recognized as mediastinal tumors but their significance is largely dependent upon other rœntgenologic or clinical characteristics.

Neurosurgery and Radiation for Relief of Pain

Cooper and Archer (*Radiology,* **43**:142, 1944) write that advanced or metastatic cancer is not a signal to bring on the opium and abandon hope. A few tumors can be arrested indefinitely, some for years or months, and many patients can at least obtain relief of pain from irradiation or neurosurgery. Pain, whether metastasis is demonstrable or not, is an indication for radiation in patients with a known malignant tumor.

Otitis Externa

Johnston (*Ann. Otol. Rhin. & Laryng.,* **53**:5, 1944) writes that many of the numerous remedies recommended in the treatment of external otitis are without much, if any, effect but metacresyl acetate is both germicidal and anæsthetic and is our most useful remedy. For the simple cases of otitis externa, an ointment composed of phenol, precipitated sulphur and salicylic acid 9 grains each to 1 ounce of an animal oil base called Neatsol is suggested. No routine can be followed and the following principles are to be adopted: 1. Thorough cleansing; (2) removal of the cause if it can be ascertained (bathing in public plunges); (3) use of germicides, (4) protection of the inflamed part and (5) general supportive measures.

Otolaryngological Aspect of Bromide and Acetanilid Therapy

Eagle (*Ann. Otol., Rhin. & Laryng.,* **53**:133, 1944) writes that the otolaryngologist is occasionally visited by a patient complaining of a headache for which no otolaryngological cause can be found and quite often such headaches are caused by intoxications from overuse of acetanilid or similar preparations and brombides, or a combination of both. Often this is the result of selfmedication. The diagnosis is made by obtaining a history of such drug intake, cyanosis and laboratory studies demonstrating ambnormal blood bromides and spectroscopic changes. The treatment consists of the discontinuance of these drugs and the taking of large of amount of sodium chloride. It is to be remembered that these drugs are habit forming. The author from a study of 49 cases maintains that headache is the most common manifestation of intoxication due to brominism and acetanilid poisoning.

Penicillin as an Inhalant

Bryson and others (*Science,* **100**:33, 1944, Ref. Current Comment, *J.A.M.A.,* **125**:1044, 1944) under the auspices of the Long Island Biological Association studied the behaviour of penicillin as an inhalant. With a standard glass nebulizer a solution of the sodium salt of penicillin was readily nebulized for inhalation. Experiments on rabbits and on human beings demonstrated that in such form penicillin passed through the respiratory tract and appeared in the urine. In rabbits penicillin was recovered from the lung tissue after inhalation. As penicillin is bacteriostatic for pneumococci, streptococci and staphylococci in extremely high dilutions, its inhalation as an ærosol may be of advantage in the treatment of respiratory infections with these and perhaps also other bacteria. The results of further experiments will be of interest. The question also arises whether penicillin will be of value as an air disinfectant.

Corneal Vascularity as Sign of Ariboflavinosis

Scot (*J. Roy Army M. Corps.,* **82**:133, 1944, Ref. *J.A.M.A.,* **125**:1069, 1944) observes that of 536 Europeans, 37 per cent presented corneal vascularity and of 1700 Africans, 5 per cent showed corneal vascularity. Judged by perleche, cheilosis and glossitis Africans had double the European numbers of ariflavinosis. Corneal vascularity cannot be taken as a guide to avitaminosis in the African. Of 136 European who were examined by slit lamp, 70 took a course of riboflavin while 50 acted as controls. This therapeutic test was negative. The The degree of vascularity fluctuates with or without riboflvin. All the Africans had a rim of pigment at the corneoscleral junction. It is possible that this protective pigment explains the striking difference in African and European corneal vascularity.

Caution in Use of Pentothal Sodium in Ophthalmic Surgery

Falls (*Arch. Ophthal.,* **31**:134, 1944) gives some warnings about complications arising out of the use of pentothal sodium in ophthalmic surgery. Coughing or sneezing occurred in about 10 per cent of his cases, but this percentage was reduced by previous cocainisation of the eye. Apnœa occurred in 5 per cent of cases and in one of these, a patient with heart disease and generalised arteriosclerosis, death occurred. When respiratory faiture sets in the author recommends artificial respiration by thoracic compression and the administration of

a gas mixture containing not more than 40 per cent oxygen and 4·5 per cent of carbon dioxide. If cardiac faiture is imminent adrenalin chloride (1 in 1000) 2 to 4 minims should be given intravenously. It should also be remembered that for intraocular operations the post operative sequelæ of pentothal sodium may be disastrous, since they include nausea, restlessness and vomiting.

USE OF OESTROGENIC SUBSTANCES FOR UTERINE BLEEDING

Clinical study of irregular menstruation during the last decade has suggested to many observers that the occurrence of prolonged flows, excessively vigorous flows and unduly frequent flows may all be evidences of hypofunction of the ovaries. Quantitative information is not available to decide whether this means a decreased amount of œstrogenic hormone production or of progesterone production or chronologic variation in the cyclic production of these materials. The most frequent accompaniment of such bleeding history has been the persistence of the œstrogenic effect in the endomotrium, sometimes accompanied by the development of the picture known as glandular and cystic hyperplasia of endometrium. Carefully conducted clinical experiments have indicated that such flowing may be interrupted by the use of large doses of œstrogenic hormone or synthetic œstrogen. Some attempts have been made to restore regular cycles of bleeding by administration of œstrogen followed by a combination of œstrogen and progesterone, or œstrogen followed by progesterone alone. The clinical benefits obtained by such methods have been at least promising, although there is not adequate evidence to justify claims for cure of a condition which is frequently persistent in terms of months or years.

Before such therapy is applied, it is considered important that careful investigation should be made to eliminate other causes of bleeding tendencies systematically and also to eliminate local pelvic disorders of neoplastic or inflammatory type. Occasionally it may be wise to use very brief courses of œstrogen to arrest bleeding so that such studies can be carried out immediately after the cessation of the flow. With such precautions in mind, additional uses of œstrogen seem warranted, and the following claims will be recognized in N.N.R.

It has been found possible to interrupt the prolonged and excessive flowing of many women with uterine bleeding of probably endocrine origin by brief courses of intensive œstrogenic therapy. This is considered safe practice only when the interval of freedom from bleeding is used to eliminate local pelvic lesions as the cause of the flowing. The subsequent administration of sequences of œstrogenic substances and progesterone to re-establish cycles of flowing is a possible method of alleviating a condition which is widely believed to result from deficiency of one or both of the ovarian hormones. (Council on Pharmacy and Chemistry. *J.A.M.A.—U. S. Office of War Information.*)

THE RELATIONSHIP OF CONGENITAL SYPHILIS TO ABORTION AND MISCARRIAGE, AND THE MECHANISM OF INTRAUTERINE PROTECTION

DIPPOL (*Am. J. Obst. & Gynec.*, March 1944) write that a series of 68 fœtuses of nonsyphilitic and 67 of luetic women were autopsied by him and certain tissues searched for the presence of spirochetes. Only fœtuses which had not reached viability were included in the study. Fœtal syphilis was diagnosed upon the discovery of spirochetes in fœtal organs. No other criterion was considered reliable for the diagnosis from autopsy material. Spirochetes were generally found in largest number in the perivascular tissues of liver and lungs. Long bone, placenta and umbilical cord were least satisfactory for the search for spirochetes. None were found in the stained preparation from the 8 fœtuses of non-syphilitic women. Spirochetes found in the tissues of fœtuses from luetic women (cases in which the blood Wassermann was positive as well as those in which serology had been rendered negative by therapy) were morphologically like the Spirochæta pallida and were considered as such since no spirochetes of any form were seen in the fœtuses of nonluetic mothers. Spirochetes were found in 16 of the 67 fœtuses of luetic mothers, an incidence of 23·9 per cent, which is the demonstrable role played by syphilis in the production of abortion and miscarriage in this series.

Spirochetes were discovered in 14 of 42 fœtus of Wassermann positive mothers, or in 33·3 per cent, and in 2 of 9 fœtus of Wassermann negative mothers (22·2 per cent), reaffirming that negative serology following antiluetic therapy is no assurance against congenital syphilis. Spirochetes were not found in fœtal tissues prior to the 18th week of gestation, *i.e.*, in the abortion period. The incidence of fœtal infection with spirochetes was found to rise from 10 per cent in the first half of the miscarriage period to 50 per cent in the latter half, with the highest incidence (66·7 per cent) in the 26th week. Appropriate conclusions relative to the role played by syphilis in terminating pregnancies before viability are drawn.

The limited material of this study suggests that there is some natural protection of the fœtus against syphilis during the first 17 weeks of pregnancy. However, Wassermann positive mothers must receive therapy before the 18th week if their fœtuses are to be guarded against syphilitic infection and both Wassermann positive and negative gravida must have therapy before the 23rd week or approximately 50 per cent of their fœtuses can be expected to be infected before viability is reached. This confirms the modern teaching that antisyphilitic treatment must be started early in pregnancy and certainly before the 18th week of gestation. Evidence is offered to show that the Langhans layer of chorionic epithelium affords appreciable protection of the fœtus against the invasion of the Spirochæta palida, even after the 16th gestational week. At this late stage it is in the form of delayed delamination and differentiation of the Langnans cells.—*U. S. Office of War Information.*

MYOMETRIAL HYPERTROPHY (SO-CALLED FIBROSIS UTERI)

WILLIAMS AND KINNEY (*Am. J. Obst. & Gynec.*, March 1944) write that patients suffering from uterine bleeding associated with a symmetrically enlarged, thick-walled uterus with little or no endometrial hypertrophy are quite frequently seen in the gynecological clinic. Various diagnoses have been applied to these uteri: fibrosis uteri, chronic metritis, arteriosclerosis uteri, metrorrhagia myopathica, etc. The material studied in this investigation by the authors consisted of ten uteri removed in patients upon whom a clinical diagnosis of fibroid tumor had been made. The symptoms in each case were prolonged uterine bleeding extending beyond or occuring between the normal menstrual periods, but not excessive in amount. The uterus in these cases presented a rather uniform picture, the most striking feature being the thickness of the uterine wall. In the present series of ten cases, the width

varied from 1·6 cm. to 3 cm., while the average thickness was 2·3 cm. This was particularly striking when it is remembered that the normal uterine wall averages 1 cm. in thickness. The uteri were enlarged in these cases and the average size was 8·2 by 6·1 by 4·2 cm., exclusive of cervix. This again should be contrasted with the normal figures of 5 by 4·4 by 2·2 cm. It was concluded that there was no definite increase in the fibrous tissue. There was no increase in the number of blood vessels, although the vessel walls were somewhat thickened.

From the above findings, *i.e.*, the actual increase in the width of the muscle fibers, the absence of increase in the number of fibers per unit width of the uterine wall, and the failure to demonstrate an increase in fibrous tissue, it would seem that the increase of size of this group of uteri is due to the increase in size of the muscle fibers. There is nothing in the history or in the microscopic findings in the cases to point to infection or to chronic inflammation as eitologic factors. Subinvolution certainly cannot be ruled out on the basis of present knowledge. Endocrine influences must also be taken into consideration as possible etiologic factors. No constant histologic abnormalities could be demonstrated in the ovaries or endometrium. In view of the present findings in this group of cases, it is apparent that the name "fibrosis uteri" is a misnomer, as evidence has been offered that there is no increase in the fibrous tissue but that the enlargement of the uterus is due to an actual increase in the size of the muscle fibers. For this reason it is suggested that the term "myometrial hpertrophy" be applied to these cases, at least until such time as the etiologic factor is definitely known.—*U. S. Office of War Information.*

Oral Administration of Pyridoxine Hydrochloride in the Treatment of Nausea and Vomiting of Pregnancy

Weinstein and others (*Am. J. Obt. & Gynec.*, March 1944) write that complete or considerable relief from nausea and vomiting of pregnancy was obtained by the authors in 68 patients who were treated with orally administered pyridoxine hydrochloride (B6) in dosages of 10 to 20 mgm. three to four times daily, receiving total dosages of from 210 mgm. to 2,500 mgm. Similar results were obtained in a group of 10 patients who received a combination of intramuscular and oral pyridoxine hydrochloride therapy; 8 patients obtained complete relief without recourse to supplementary therapy, and 8 patients required additional therapy. Of 37 patients with nausea confined to the morning, 34 were completely relieved, 3 partially relieved. Of the 18 patients with nausea extending throughout the day, 17 were completely relieved, 1 partially relieved. Of the 13 with nausea and occasional vomiting, 11 were completely relieved; 2 were relieved of vomiting but complained of occasional nausea. Ten patients with nausea and vomiting so severe as to prevent the retention of food were observed. Of these, 8 obtained complete relief with the combined use of orally and intramuscularly administered pyridoxine hydrochloride, and 2 required additional therapy. No toxic manifestations were noted. The use of pyridoxine hydrochloride has proved of value in this group of 78 patients, but the value of sedation and adequate dietary supervision should continue to command attention and should be utilized with pyriodxine hydrochloride as an important adjunct in the therapy of nausea and vomiting of pregnancy. A far larger series of patients must be carefully analyzed before final conclusions may be reached.—*U. S. Office of War Information.*

Peripheral Circulatory Collapse in Toxaemia of Pregnancy

Lambeth (*Am. J. Obst. & Gynec.*, March 1944) writes that the subject of peripheral circulatory collapse or shock in toxæmia of pregnancy had not received much emphasis until recent years. Dexter and Weiss introduced new conceptions of the pathologic physiology of the disease. They argued that the cardiac failure was largely due to water retention and that primary central congestive cardiac failure is not common in an uncomplicated case of toxæmia of pregnancy. They stated that peripheral circulatory collapse is the most important complication of toxæmia of pregnancy and may have considerable influence in determining the prognosis of a given case. They recommended the use of blood transfusion or concentrated protein solutions to combat this collapse.

The present report is primarily concerned with nine patients who illustrate the importance of peripheral circulatory collapse in severe toxæmia of pregnancy. They represent all grades of circulatory collapse, from a slight elevation of the pulse and fall in blood pressure, to frank shock. The treatment of these patients was very conservative and included the usual measures for toxæmia. All received whole blood plasma intravenously when any signs of circulatory collapse appeared. The collapse developed so suddenly in some patients that they received plasma only after signs of frank shock were present. In others, the process was more insidious; these patients received plasma after slight pulse and blood pressure changes. Continued improvement was always accompanied by diuresis. It is not certain whether the diuresis was in part the result of the plasma therapy. No patient had excessive blood loss and no severe infections occurred.—*U. S. Office of War Information.*

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ASSOCIATION OF PHYSICIANS OF INDIA

In inaugurating the Association of Physicians of India at Madras on 15-11-44 Dr. Jivraj N. Mehta, M.D., M.R.C.P., Ex-Dean, Seth G. S. Medical College and K. E. M. Hospital, Bombay, said:

Ladies and Gentlemen,

You have done me great honour in asking me to preside on this occasion and to inaugurate the Association of Physicians of India, for which I feel deeply grateful to you all. As you are aware, this Conference has been a long-awaited event. When I heard of this idea during my stay in Yervada Central Prison, I felt it to be a step in the right direction; and mentally blessed it, being unable under the Defence of India Act to inform the organisers of the Conference how pleased I was at the thought of having such an Association in India. As you know, it was first proposed to convene this Conference earlier in the year; and our eminent colleague, Dr. B. C. Roy, President, the Indian Medical Council was to inaugurate it. But the pressure of his manifold public activities, to which he has increasingly devoted his time and energy in recent years, and in which we wish him every success, prevented him from performing the function of inaugurating this Association, for which he is undoubtedly the fittest person. As he is not available, Ladies and Gentlemen, I am asked to fill in the gap, and am happy to accept the honour.

Purpose of New Association

A number of friends have asked me whether it is really necessary to start this new Association, and whether the Indian Medical Association cannot do all that may be at the back of the minds of the organisers of this Association. Most of you know how closely I have been connected with that body and in what high esteem I hold it. Had I the faintest doubt in my mind that the inauguration of this Association would in any way affect the function, the importance, the utility, and the popularity of that great body of medical men and women in India, the Indian Medical Association, I would not have had anything to do with this new Association, however well sponsored it might have been from eminent quarters. Whatever doubts I may have had in mind when such specialist associations began to be formed 10 years ago about their affecting the work and usefulness of the Indian Medical Association, have long been dispelled. We have, I believe, four or five such associations of specialists of different branches of medicine in India. While they have grown in numbers and importance during the course of the last ten years, and have done much for the development of their respective special branches in India, the Indian Medical Association has also been rapidly growing in strength in recent years.

We need have, therefore, no fear in our mind of any possible conflict of interest between this Association and the Indian Medical Association. The latter will continue to occupy its pre-eminent place in the minds of the medical fraternity throughout India. It is high time, therefore, to form an All-India Association of Physicians in the country. As a matter of fact the formation of such an association has been long overdue. As stated in the circular issued last February, "it is of advantage to have a forum where one can exchange and discuss ideas and experiences of value to our branch of the profession". The unchaining of gigantic forces in all quarters of the globe in recent years "has given a fillip to research in the means and methods of treatment of many diseases"; and for years to come "there will be to the credit of medical knowledge a considerable volume of data which we should take advantage of."

Importance of Medical Research

It is not only the pooling of knowledge gathered elsewhere that we should justify our existence. It will be our duty to contribute to it to the extent our ability and our resources would permit us to. For such achievement, much State help as well as private philanthropy would be needed. The State in India, has, alas, not yet properly realised its duty towards Medical Research. The Indian Research Fund Association used to get in the twenties an annual grant of 7½ lakhs—a small amount indeed compared to large sums voted for Medical Research by the State in the United Kingdom, Germany and other countries prior to the war. With the Inchcape axe, Government did not hesitate to cut down this amount very substantially; and in the early years of the present war it was still further reduced. Last year the annual grant from Government came to be a paltry sum of Rs. 1¾ lakhs for work to be done in the length and breadth of this vast sub-continent! No doubt some grants for research are provided every year from the reserve fund of the I.R.F.A. With the help of such annual grants, the total amount disbursed by this Body on Medical Research, which had amounted to over 13 lakhs a year in the late twenties has been steadily reduced, year by year, until it came down to less than 5 lakhs last year! One would have thought that in war-time at least research—not only industrial and general scientific research, but medical research also, should have been materially helped by the State if the sufferings of humanity were to be properly attended to.

It is not only the provision of funds for research that is important; but also their proper distribution. That is really vital to the growth of medical research in the country. While a substantial portion of Research grant, placed by the Government in the United Kingdom at the disposal of the National Research Council in London, was made available for encouraging research in its medical schools, teaching hospitals and university laboratories, corresponding bodies in India were treated as Cinderella by the Indian Research Fund Association, except in the case of the School of Tropical Medicine, Calcutta. The lion's share of the grants annually disbursed by the I.R.F.A. went to Government laboratories, which are generally divorced from any real contact with the universities, medical colleges and teaching hospitals in this country. It was only after years of agitation and effort that some enquiries undertaken in certain medical colleges came to be aided by grants from the I.R.F.A,; the grants so voted or the amount set apart for a few Research Fellowships, forming only a small part of the annual expenditures of that body. It is no wonder, therefore, that unlike as in other countries, barring perhaps a couple of institutions, medical research forms hardly any part of the normal activities of medical colleges in India.

Authorship of Research Publications

In Government laboratories and such other medical institutions, where grants from the I.R.F.A. were available for enquiries or the study of specific problems, a most nefarious practice had grown up to the detriment of the spirit of research, of the senior officers or Heads of Departments or of Laboratories taking the main credit for the work done and assuming for themselves the entire authorship or the senior authorship of papers published. It was even urged in some quarters that the

older man should be the senior author *whatever* his connection with the work; and that the assistant who had collected the data for enquiry should have no claim at all to authorship.

This tendency needed to be put down if enthusiasm for research was to grow among junior workers; and in recent years the Governing Body of the I.R.F.A. had to rule, on my insistence, that all research workers should have their share in the authorship of the publication of their joint work. Definite rules have come to be framed governing this matter. Now that enquiries are being helped by the I.R.F.A. medical colleges, and that Research Fellowships have been instituted, it behoves the teaching staff in medical schools to avail themselves fully of the facilities now available, meagre though they are, and encourage the Housemen and other junior staff under them to take up investigations either during or after completion of their hospital or college appointments.

Call to Philanthropy

I would also urge that those of our colleagues in different parts of the country, who have been fortunate enough to have a lucrative practice, to part with some of their collected wealth to endow medical research. Unless those of us, who are able to do so, set an example, it would be difficult to persuade others to endow funds for work where returns may not be available for years. A millionaire in business wants quick returns on his outlay; and unless this is so, he is generally chary of parting with money. The utmost extent, to which ordinary philanthropists have persuaded themselves to divert charity from the traditional Indian ways of building temples or mosques, dharmshalas or fountains, or for feeding the poor, has been towards such objects as constructing hospitals and dispensaries, *i.e.*, to such purpose as can be readily seen in a concrete, tangible form. In recent years, thanks to the high profits on account of war conditions, industrialists have come to realise that industrial and scientific research is of benefit to the industry and increases their profits as well. But hardly any philanthropist, barring the noble House of Tatas, has yet been persuaded to donate large sums for pure medical research as such. In the faculty of science we had such noble Teachers as the late Sir Jagadish Bose and Sir P. C. Ray who have given most liberally of their earnings for the promotion of scientific knowledge in their respective field of work. In the faculty of law, we have the magnificent example of Sir Rash Behari Ghosh. Can we boast of a single medical man in the country who has correspondingly given out of his earnings for the promotion of medical research? And let it not be forgotton that a fairly good number of them have earned and amassed what used to be called in my younger days 'fabulous wealth'. I earnestly hope these eminent members of the profession will dig deep into their pockets, and provide funds for medical research. I also hope that physicians in India will persuade their rich patients to divert a part of their charities to medical research, and thus make it possible for our young colleagues to devote their time and energy to enquiries to a much larger extent than what has hitherto been done.

Need for Simpler Medical Courses

Besides medical research, it will be our duty to take our due share in problems of medical education, both graduate and post-graduate. Our young men are made to learn a lot for their graduate degrees, which they soon forget; the knowledge so forgotten not being necessary for the prosecution of general medical practice. The medical curriculum has long since reached the limit of human endurance. The courses must be simplified. The curricula in most cases should be shortened. Specialisation has grown so tremendously that most specialists demand that every medical student should have a fair knowledge of the subject of their speciality. In their enthusiasm they become almost blind to the fact that the young medico would not need, in his general practice, a lot of such specialised knowledge. It would not be wrong to say that about 75 per cent to 85 per cent of an average general medical practitioner's work belongs to the sphere of medicine proper. Minor surgery, gynaecology, eye, ear, nose and throat, skin or venereal, etc., work, all combined, would constitute the rest of his general practice. With such proportionate demand on his knowledge of the various branches of medicine, it would be naturally expected that at least three-fourths of the time spent in clinical studies, during the hospital courses of his study, *i.e.*, in the last three years of his medical college career, should be devoted to the study of the subject of medicine proper. Instead, he devotes barely a third of the time prescribed for clinical work to such study; while the other subjects take the lion's share of the time set apart for clinical work. Medical education has thus become topsy-turvey; and it behoves us to see that such anomalies as exist in the rule laid down by the Universities and the Medical Council of India are rectified as early as possible and the burden on students lessened.

Whole-time Teaching Staff in Clinical Subjects

A question has been raised, whether medical education would not improve by the appointment of a certain number of wholetime teachers in medicine and surgery in medical colleges. Mr. Tauton, Adviser to the Governor of Bombay, said in a recent speech reported in the press that "one of the suggestions made was that they should take a leaf out of the book of hospitals in London, and appoint a whole-time teaching staff in place of the honorary staff. That would mean a heavy financial burden, but Government wanted an experiment at least with one subject to begin with." The scheme, so far as it is known, aims at appointing a unit consisting of a Professor and an Assistant Professor, both well paid, and some junior staff. But is the scheme as adumbrated really a leaf out of the book of hospitals in London? The essence of the scheme is not only to have two well-paid wholetime members of the unit, but of other equally important requirements. They require the facilities of a good laboratory for themselves and also the assistance of a good pathologist if their work, both in the field of medical education and that of research is to succeed. But, so far as I know, none of these essentials to such a scheme are provided. The appointment of a wholetime teaching staff without right of private practice, in place of the honorary staff, by itself would not "raise the standard of medical education" and show 'better results in the M.B., B.S. examination' of the Bombay University, which are, I regret to note, really poor. In the subject of Pathology the teaching staff is wholetime at both the medical colleges in Bombay, and yet the results at the University examinations in this subject are not in any way appreciably better than those in the clinical subjects. I wonder if the late Surgeon-General with the Bombay Government was aware of this fact before he persuaded that Government to be committed to the said scheme. In my opinion there is something radically wrong in the system of examination in the Medical Faculty of the Bombay University; in the method of appointing examiners, in the system of election to the Senate and other Bodies of that University and in the method of its

administration, which leads to favouritism and which makes it impossible to take strong action except when gross malpractices come to light. All this cannot be improved by tinkering with the problem in the way proposed. The scheme of appointing fulltime teaching staff in clinical subjects is, therefore, for reasons already given, a half-baked one like the other retrograde scheme of the said Surgeon-General instituting the Diploma of L.M.P., in the teeth of opposition of the medical profession in Bombay; ultimately leading to a strong difference of opinion between the Bombay Government and the Bombay Medical Council in the matter of registration of that diploma; a scheme which was in fact against the spirit of the decision of the Conference convened in New Delhi in November 1938, by his own patron, the late Director-General of Indian Medical Service, Major-General Bradfield. That Conference, of which he was a member, has recommended to do away with the licenciate diploma altogether at an early date, a recommendation to which he himself was a party. I am indeed glad that you in Madras, who were pioneers in the country in abolishing the 'Licentiate Diploma,' did not succumb to the idea of restarting such a diploma, even as a war measure, though efforts to such effect were not lacking. My congratulations to you for having been saved from such a retrograde action.

Reverting to the full-time unit system I must emphasise that unless ample facilities for work by whole time teachers are provided, it would be sheer waste of public funds to carry on with this half-baked project as is proposed to be done at the Grant Medical College, and the Sir J. J. Hospital in Bombay. These funds would be far more beneficially utilised in immediately providing better facilities for the instruction of students at the medical schools in the Province at Poona and Ahmedabad, and thus converting them into colleges, a project which has been on the 'tapis' since many years past. As regards the full-time units, it may be said that even in institutions, where such units are provided, it is an acknowledged fact that the greater part of the teaching is done by the honorary staff. In an advertisement about itself, the University College Hospital Medical School, London, which was one of the first institutions to start such units, this has been well brought out. It states:— "The whole-time Directors of Units are concerned with the organisation of the teaching generally; but the honorary staff are responsible for the largest share of the teaching in the Wards and the Out-patient Department of the Hospital." This is natural as the small number of fully paid staff cannot devote individual attention, looking to the large number of students in most medical colleges in India, that a medical student requires. The teaching staff, whether full-time and well-paid or part-time and honorary, needs supervision to ensure proper instruction of the students. It should be the function of the administration to see that the staff do their duty by their students.

Post-Graduate Medical Instruction

We must confess that in the matter of post-graduate education, we are much behind many countries. It is a crying shame that we have neglected these studies in the past. There is no doubt that there is an awakening in the country on this matter; and various universities have begun to institute many post-graduate medical degrees and diplomas. But it is not enough to institute such degrees and diplomas. There should be adequate instruction. The Associations of various specialities can help quite a lot in the matter. I trust each of them will see to it that adequate facilities and instruction are provided in the matter of each such degree and diploma, so that those holding them are in every way competent to hold their own in their speciality.

Indian Dietary

The subject of Nutrition has been for several years the concern of most countries in the world. In the present war, it has naturally assumed a pre-eminent place in the life of an army as also of the civilian population. The study of nutrition in this country in modern days began with the work of Major-General McCarrison in your own province at Coonoor. In recent years an increasingly larger number of our countrymen is devoting time and effort to this work. But we have so far only touched the fringe of the problem. We are still very far from evolving an Indian dietary on modern scientific basis. This will have no doubt to vary to some extent from province to province, depending upon the nature of the soil and its produce, the proximity of the sea and large rivers for a portion of the food supply, as also upon climatic conditions, and to a certain extent upon local 'taste.' Though modern scientific medicine has been with us for over a hundred years, we have not yet evolved a dietary suitable for those with vegetarian habits, either in acute illness or during the stage of convalescence. The instruction given on this subject in teaching hospitals is, I grieve to say, very meagre. It would behove us physicians, to move actively in the matter of evolving our dietary so that our patients are able to have a sufficiently nutritious and easily digestible diet, cheap withal. The older generation of women in India had some working knowledge of the essentials of a good dietary in health and in illness, as also of some household remedies. This knowledge is rapidly fading out from the present generation of women living in towns and cities; and unless we adopted measures for the imparting of such knowledge based on modern study, the country will be in a sorry plight indeed. The men and women in the country will need to be educated through specially prepared pamphlets on the essentials of a good national dietary and dealing with cheap household remedies. It will be for you to consider what part this association can play in such effort.

Medical Men in Pharmaceutical Industry

In the matters of drugs also, we are indeed in a very bad way. The lessons of the last war were lost in the country. Both the State as well as the industrialists have been criminally negligent and our pharmaceutical and allied industry made little progress in the intervening period between the two world wars. For the proper development of the drug and allied industry, a close association of the members of the medical profession is necessary. While you in Madras and our colleagues in Calcutta and some other provinces were fortunately placed in this respect, in Bombay and some other provinces the Provincial Medical Councils had set their face against any association of those on their respective medical registers with such industry. They were afraid that their so-called medical ethics would be grievously affected if the rules laid down by them for the guidance of the members of the profession on their roll permitted any such contact. In Bombay some of us had to put up a stiff fight so late as 1941, to remove such a ban. In this connection, I would like to pay tribute here to the then Surgeon-General with the Bombay Government, whom I have criticised above for some of his measures. As President of the Bombay Medical Council, he was prompt in appreciating the necessity of medical men working as technical experts to or as directors of pharmaceutical and allied concerns; and it thus became

possible for us to liberalise the code of medical ethics in that Presidency. Though the situation in the matter of the drug and similar requirements of the country today, is somewhat easy compared to the straights we were in in the earlier years of the war, the country continues still to be in distress and the cost of medicines, etc., is still very high for some of our essential requirements.

Need of Cheap Medical Treatment

Apart from this the cost of treatment prescribed by us is very high for an average person and is prohibitive to those with slender means. The craze for injections is really maddening. It has spread even amongst villagers. As a matter of fact, many patients do not feel happy, nor do they think their treatment is completed unless they had a course of injections. While this indicates, no doubt, some progress in the minds of the people towards modern scientific medicine, is it in the economic interest of the country as a whole? This craze for injections and costly patent and proprietary medicines, whether manufactured locally or imported from abroad, may mean fat dividends or profits to those in such business and be a source of income to members of the medical profession, but what about the poor or the man of moderate means who is to pay the price thereof? He has either to get into debt or suffer from a psychological factor of not being able to provide for such treatment compared to his relatively better-placed neighbour. For such a position I lay the blame primarily on the consulting members of the profession. It is the methods of treatment primarily prescribed by them which has brought about this state of affairs. It is in their hands to put down this craze for injections and costly medicines which has naturally filtered from their rich clientele to the relatively poor and so on. If this state of affairs is allowed to persist for long, it would bring about a reaction in the minds of the leaders of the nation who are in anguish at the poverty of the masses. I see signs of this coming and let us beware in good time. If village medical relief is to progress in the country, and it must undoubtedly do so at a far greater speed than has been the case hitherto, as almost eight persons out of ten in India live in villages, we shall have to work out a very cheap method of treatment. It should be the prime duty of physicians in teaching institutions to make it a point to instruct students more and more in this direction.

Indian Pharmacopoeia

The need of having our own pharmacopœia is being increasingly felt. I am glad that efforts are now in progress in this direction, but they are very very slow. The Association of Physicians can play an important role in such a compilation. I trust you will take the matter in hand and also ask for the inclusion of its representatives of the Pharmacopœia Committee.

Medium of Instruction in Medical Colleges

Another important question which we shall have to consider in course of time, if not in the years that will immediately follow, is as to the place of Indian language in the instruction of medical students. I am of opinion that if scientific teaching is to be effective, it will have to be through the medium of the mother tongue. Some of you would, I fear, be surprised at such a suggestion. But on reflection, you will agree that this reform needs to be taken in hand early. "At the present moment the training of all medical men, the record of the notes and treatment of hospital cases, are being carried out in a foreign language. As a result of this, the co-operation that should exist between the physician and the patient does not materialise to the same extent as in other countries; and the man in the street, looks askance at scientific medicine, as something alien and imported from other countries. It is to some extent for this reason also, that contributions to the advance of medical knowledge from the people of this country have been relatively meagre; and a large number of men fail to appreciate the essential difference between the scientific method which is taught to them in another tongue, and scholastic speculation which they come across in writings in their own tongue." In the words of Mahatma Gandhi, "English having been the medium of instruction in all the higher branches of learning, has created a permanent bar between the highly educated few and the uneducated many. It has prevented knowledge from percolating to the masses." To quote from a memorandum which I, along with other friends in Bombay, had submitted to the Honourable the Minister of Health, Bombay, over five years ago:—

"It has been widely accepted by most people who have thought over this subject that education, when it is imparted in the mother tongue, leaves more lasting impression on the minds of the individuals and stirs up mental processes which are more conducive to research and reasoned thinking. There is no reason to suppose, nor does the experience of other countries suggest that technical education in different provincial languages in a big country like India would militate against the idea of a United Nation. It is our belief that clearer thinking resulting from such an education would, if anything, promote the ideals of co-operation and co-ordination between the members of the medical profession."

There should be no fear of the standard of medical education deteriorating with a change of langauge in which instruction is imparted. "It is the opinion of experienced teachers that with the exercise of proper care in the planning of the curricula, in the appointment of suitable teachers and examiners, the standards should show a definite amelioration instead of a deterioration." It should, therefore, be one of our functions to see that Indian languages are cultivated and developed so as to rise to a level sufficient to convey scientific instruction of the highest degree through that medium.

Study of Ayurvedic Medicine

I would also like to place another question before you: What is going to be the attitude of this Body of Physicians towards Ayurvedic Medicine? Please do not fear that I intend by such a poser to put back the hands of the clock by a thousand years or more. But the fact remains that there is a large amount of knowledge in the ancient books of Ayurvedic Medical Science; much of it, alas, not even properly followed by its own so-called votaries. Our seers have made observations on most aspects of human life. What they have said on logic and philosophy still holds the field. It cannot, therefore, be that their observations on life processes, living organisms, animal life and plant-life, which are embodied in the books on Yajur Vedas would not, even in these days of great scientific progress, hold their own in many respects. It should be our function to encourage the study of these books; and to help all those who have taken up such study and find out if they do not contain some observations which still baffle the modern scientist.

(Continued at foot of page 58)

REVIEWS

CATECHISM SERIES—DISEASES OF THE EYE—Fourth Edition. 66 pages. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 1s. 6d. net.

An attempt has been made to include the various diseases and refractive errors of the eye in this small book of 66 pages. Naturally, a scientific approach to the subject could not be accommodated. This book is written in the form of questions and answers. A few mistakes have unfortunately crept up possibly due to oversight. As for example, in page 23, while discussing the treatment of corneal ulcer (hypopyon ulcer), the author has recommended "scraping" the ulcer with a pointed match dipped in carbolic acid and 30 per cent sulfonamide drops every hour. I think 30 per cent sulfonamide drop every hour is too drastic a measure and will be too irritant to the eye. We usually "touch" the ulcer with pure carbolic acid and do not "scrape". However, this will be quite a good quick reference book for students appearing in the examination.

B. K. Das Gupta.

CATECHISM SERIES—MENTAL DISEASES—Third Edition. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 1s. 6d. net.

The author's name does not appear in the book. But he deserves congratulation on his success in covering a fair ground of psychiatry with only 84 pages. The busy general practitioner having no time to acquire knowledge from bigger books by well-known authorities may get a useful glimpse in the domain of psychiatry by a rapid survey of this booklet. There ought to have been a chapter on war neurosis and relations of trauma to development of neurotic conditions could have been considered in greater details, with advantages. Informations available in the section of drug addiction, which is of tremendous importance to the general practitioner, is scant. In the discussions on dementias, Pick's disease and Abzheimer's syndrome have not been mentioned. The use of dilantin sodium in epileptic psychoses should have been given in details, the drug having come into use comparatively recently.

Himansu Roy.

CATECHISM SERIES—VENEREAL DISEASES—by A. C. Ewing. Second Edition, E. & S. Livingstone, 16 & 17 Teviot Place, Edinburgh. Price 1s. 6d. net.

The booklet deals with syphilis, gonorrhœa, chancroid and lymphogranuloma inguinale. It is unfortunate that granuloma inguinale has not been discussed at all. In the chapter on syphilis, the dark ground examination of spirochætes should have found a place, particularly when Lange's colloidal gold test has been given with a fair amount of details. Treatment of syphilis with mapharside has been recognised. Arsenical jaundice not merely "resembles infective catarrhal jaundice" as the author writes but as recent work reveals it is an infective hepatitis caused by a virus. In the section on chancroid, therapeutic use of Dmelcos vaccine has been overlooked. In the chemotherapy of gonorrhœa, sulfanilamide, sulphapyridine, sulphathiazole and sulphadiazine have been mentioned, although no information has been mentioned, as to the method of administration of the last two drugs. Inspite of these criticisms the booklet possesses a large amount of useful information (for students chiefly) in a narrow compass of 80 pages.

Himansu Roy

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors.—Editor.

PENICILLIN

The Editor, *Journal of the I. M. A.*, Calcutta.

Sir,—I have read with interest your editorial on "Penicillin". You said, "Penicillin has become widely known with the publicity given to this chemical agent during the treatment of some world famous persons. Penicillin is remarkably effective in the treatment of infections by staphylococcus aureus, pneumococcus, hæmolytic streptococcus, gonococcus and meningococcus". But unfortunately I really fail to understand why and how this latest wonder of the world-wonders has been proved absolutely *ineffective* in the treatment of Kasturba Gandhi (wife of Mahatma Gandhi) and Wendell Wilkie who ultimately died inspite of penicillin.

Again, as regards the modes of administration of penicillin, it has been stated by the U. S. War Production Board, "Penicillin is a remarkably potent antibacterial agent which can be given intravenously, intramuscularly or topically, it is ineffective when given by mouth". This view has not only been admitted by Dr. W. Schweishiemer, M.D., of New Rachelle, N. Y. and Dr. B. B. Roy of the Carmichael Medical College, Calcutta, but you too, have accepted. It cannot be administered by mouth because it is destroyed by the acid gastric juice. "Secondly, regarding the storage of penicillin, you remarked, "The sodium salt which has been marketed, is not a stable compound and is subject to deterioration if exposed to higher temperatures and even room temperature for an extended period. So it is advised to store the product at a temperature below 5°C. This precaution should be more scrupulously observed with regard to solutions intended for parenteral or local administration. Even if it is stored at the above temperature the potency slowly deteriorates after a time." But here I could not find out an explanation how it had become possible for Messrs. Deodhar Bros. of 204, Hornby Road, Fort, Bombay to manufacture "Bell's SOLU PENICILLIUM" for parenteral and oral administration and these advertisements are being regularly published in your journal. Personally I raised this point amongst the fellow members of our profession at Asansol but I could not get any satisfactory reply. Will you please enlighten me on these points of controversy? What is the real chemical formula of penicillin? Is it $C_{14}H_{19}NO_6$ or $C_{14}H_{17}NO_5,H_2O$?

I hope Dr. Roy and other fellow research workers on penicillin will satisfy my inquisitiveness through the columns of your Journal. I am etc,

Asansol,
28-10-44.

(Dr.) B. K. Rai Chowdhury,
Publicity Officer,
Asansol Mines Board of Health, Asansol

[Penicillin has got its limitations in application as pointed out in the editorial. In the absence of any precise detail of illness of the two persons, no opinion can be given. The Journal, does not guarantee the potency or effectiveness of medicines advertised in it. The exact chemical formula of Penicillin is not yet known.—Editor.]